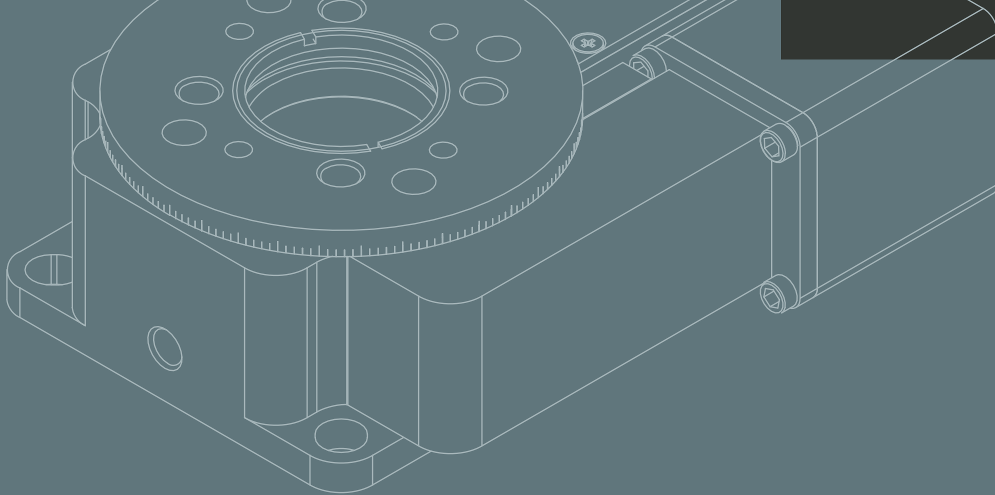
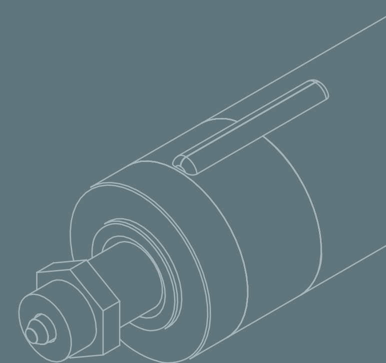


ZABER

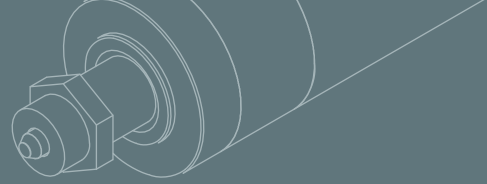


Sign up for Zaber's newsletter at www.zaber.com for special promotions

ZABER TECHNOLOGIES

Simplifying Motion Control

Product Catalogue · 2012 · www.zaber.com



Mail **Zaber Technologies Inc.**
1st Floor, 1777 West 75th Avenue
Vancouver, British Columbia, Canada
V6P 6P2

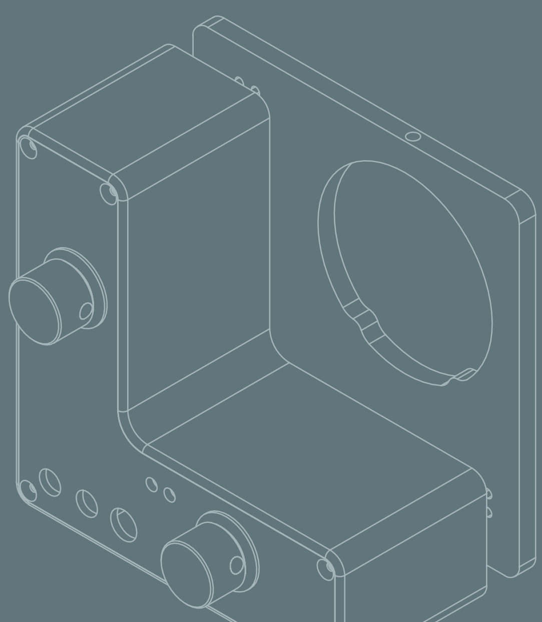
Email contact@zaber.com

Website www.zaber.com

Phone 1-888-276-8033 Toll Free (Canada and USA)

Direct 1-604-569-3780

Fax 1-604-648-8033



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ZABER Simplifying Motion Control

Contents

How Zaber got its start

Zaber Technologies was founded in 1997 by a group of friends with diverse interests and knowledge of electro-mechanical systems, programming, and physics.

Back then, precision linear actuators all used DC motors with gearboxes and encoders, and they required complicated motion control cards, bulky controllers, separate driver amplifiers, and special power supplies. Precision motion control was expensive, difficult to set up, and cumbersome to use.

Zaber's founders recognized the need for an inexpensive, integrated solution for motion control. They wanted to make motion control products that were easy to set up and ready to use right out of the box, so they created the world's first precision linear actuator with a built-in controller. It was based on a stepper motor instead of a DC motor, gearbox, and encoder combination. The integration of all control and drive electronics in the same package became the foundation of Zaber's T-Series product line.

Where we are today

Since the introduction of our first linear actuator, the T-LA28, we have expanded our offerings to include over 100 motion control products distributed worldwide. Researchers, engineers, distributors, systems integrators, and OEMs have come to appreciate our innovative products and excellent support. We continue to advance our in-house manufacturing processes allowing us to build, test, and ship most of our products within 3–5 days.



At Zaber, we are dedicated to:

Integrating your feedback into our products

When you talk, we listen. We continually expand and improve our product line based on your feedback and requests.

Providing excellent service and support

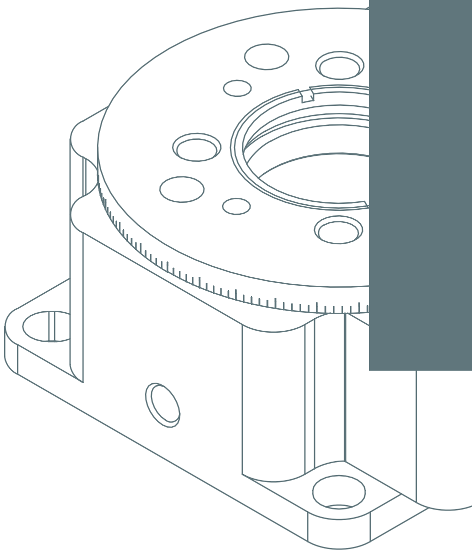
We strive to offer the best service and technical support in the industry. We believe that these are the key ingredients in creating and sustaining a positive relationship with you.

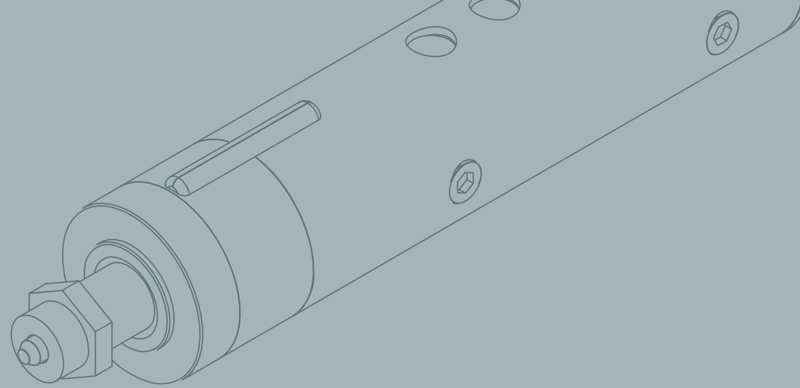
Offering the best price to performance ratio on the market

We make products that strike a unique balance between quality, performance, and economy.

Simplifying motion control

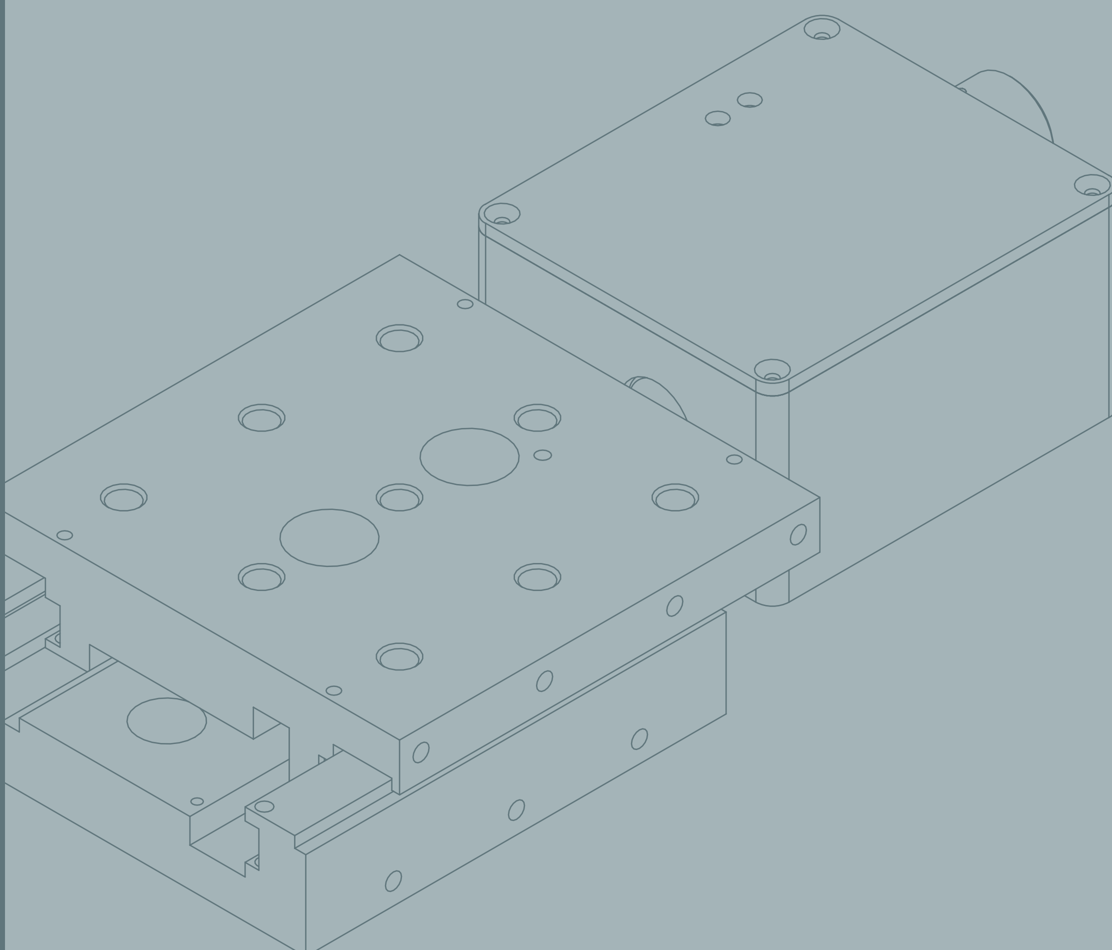
Most of our products are ready to plug into a computer and run right out of the box. Our software is quick to install and easy to use. No one likes paperwork, so we also try to make ordering and servicing as painless as possible.





ZABER

Simplifying Motion Control



ZABER

Simplifying Motion Control

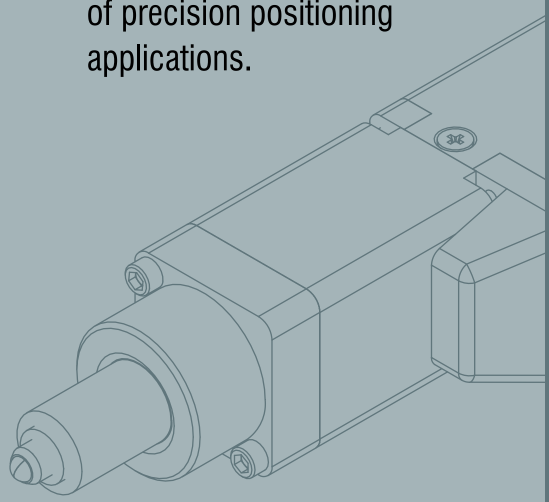
ZABER TECHNOLOGIES

Automate precision positioning tasks quickly and easily with Zaber products.

We offer an extensive line of computer-controlled linear actuators, linear stages, rotary stages, mirror mounts, motors, and other devices.

Many of Zaber's products have built-in controllers and can be daisy-chained and controlled from a single serial port.

Whether you need a single device or want to seamlessly combine several units in a multi-axis set-up, Zaber's motion control equipment is ideal for a broad range of precision positioning applications.



Vacuum Devices



Vacuum Stages and Actuators
with Built-In Controllers

Rotary



Rotary Stages
with Built-In Controllers

Linear



Linear Actuators
with Built-In Controllers



Miniature Linear Stages with
Built-in Controllers



Long-Travel Linear Stages
with Built-In Controllers



Manual Translation Stages

Multi-Axis



Multi-Axis Systems
with Built-In Controllers

Controllers and Joysticks



Stepper Motor Controllers

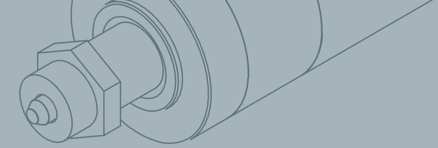


Programmable Joysticks

www.zaber.com

When you talk, we listen. We continually expand and improve our product line based on your feedback.

ZABER Simplifying Motion Control



ZABER TECHNOLOGIES

Easy installation

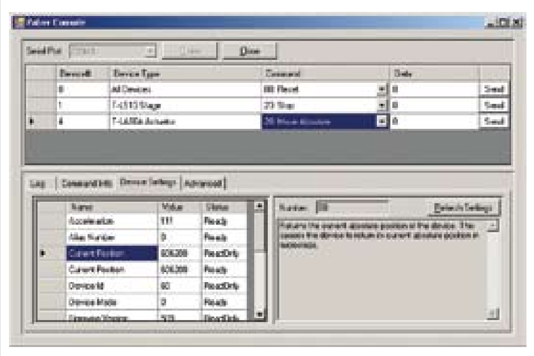
Step 1.
Connect your Zaber device to your RS-232 port using the included serial adaptor. We offer USB to RS-232 converters if you have no RS-232 port.



Step 2.
Connect the included power supply to your Zaber device.



Step 3.
Install free Zaber software to execute simple instructions or complex motion sequences. Software can be downloaded at www.zaber.com/wiki.



Expandable design

Automating more than one axis?
You can daisy-chain up to 254 Zaber devices to a single RS-232 or USB port. Power can be transmitted through the data cables of most models, allowing multiple devices to be powered from a single power supply. Minimal hardware and cabling make Zaber products easy to set up and help reduce clutter on the workbench.



Versatile software

Zaber software is easy to use.
It automatically recognizes all your devices and allows you to communicate with each one. You can easily set up automated routines, and programmers can modify the source code for advanced customization.

Our software is available in many popular languages including LabVIEW, Visual Basic, C#, Excel, and C. All our software is available for free download.

Questions or concerns? Our technical support is here for you.

At Zaber, we specialize in motion control technology. When you contact us, you’ll be speaking with an experienced applications engineer who knows our products inside and out. If you need help with your products, we can guide you. User manuals and troubleshooting guides are available online. Plus all our products are covered by a one year warranty.

1-888-276-8033 (Toll Free – Canada and USA)
1-604-569-3780 (Direct)

www.zaber.com

About Our Products

Built-in controllers simplify your set-up

We've designed many of our precision positioning devices with integrated controllers, so there's no additional hardware for you to install. The controller and stepper motor driver are built right in, which reduces cost, device footprint, and cable clutter.

The choice is yours: enjoy complete automation through computer control, or use manual control

Zaber devices are perfect for automating your positioning needs. Our free software allows you to send single commands or complex sequences. Most models offer a manual control knob so that when you want to, you can position your device by hand as well. The speed varies depending on how far you turn the knob in either direction, and the computer will continue to track the device's position throughout a manual move.



We've got the accessories you need

Most Zaber products use standard 15 V wall-mounted power supplies, and we offer suitable alternatives to match the input voltage in different regions around the world. Kit versions of Zaber products come complete with a power supply, a six-foot cable, and a serial port adaptor. We recommend you start with a kit version, though if you need multiple motion devices for your application, each device can also be purchased without accessories. If you need longer cables, alternate power supplies, or other optional items, we can help you choose the right ones. You can see a list of compatible accessories, including power supply substitutions for each device, on our website.



Sustainability is important to us

It's important to us to minimize any negative impact we may have on the environment and on the health and safety of our communities. We are continually improving our devices to reduce the use of any hazardous substances, and our products are RoHS compliant. The packaging we use is recyclable in most regions. If you have any suggestions for how we can further reduce the environmental impact of our products or activities, we would be happy to hear from you!



WITec GmbH

www.witec.de

WITec is a manufacturer of high performance optical and scanning probe microscopy systems solutions for scientific and industrial applications. A modular product line allows the combination of different microscopy techniques such as Raman, NSOM, or AFM in one instrument for flexible analyses of optical, chemical, and structural properties of a sample. The instruments are distributed worldwide and are mainly used in materials sciences, life sciences, and nanotechnology. WITec's headquarters are based in Ulm, Germany, and Maryville, TN, USA.



We integrate three Zaber T-LA28A-S actuators in our Scanning Near-Field Optical Microscope alpha300 S for moving the inverted microscope's objective in three axes. An additional actuator is used for conveniently moving a filter slider. The T-LA28A-S gives us a resolution of 100 nm, perfectly matching our demanding requirements in high-resolution microscopy.

We favour the Zaber actuators because they can be easily activated by our microscope control electronics and software, and because we can easily connect several actuators in one system.

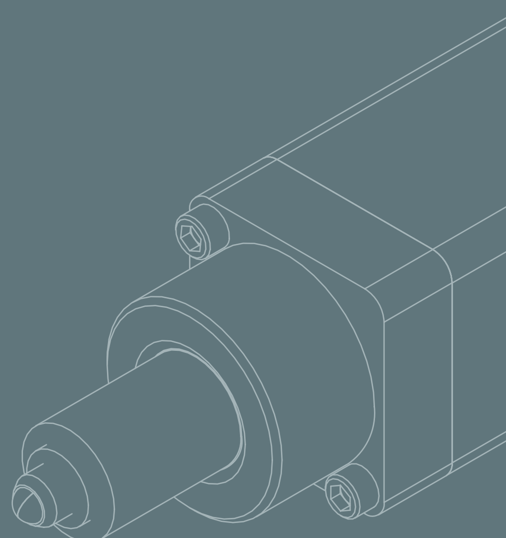
– WITec GmbH







Linear





- **Integrated motor and controller in a tiny package**
- **Excellent thrust, speed, and accuracy**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-NA linear actuators are computer controlled and offer 0.05 μm resolution, with either 25 mm or 50 mm travel. Each actuator comes with a hardened ball tip that you can remove if you prefer to use the built-in threaded tip or a flat tip.

Installation

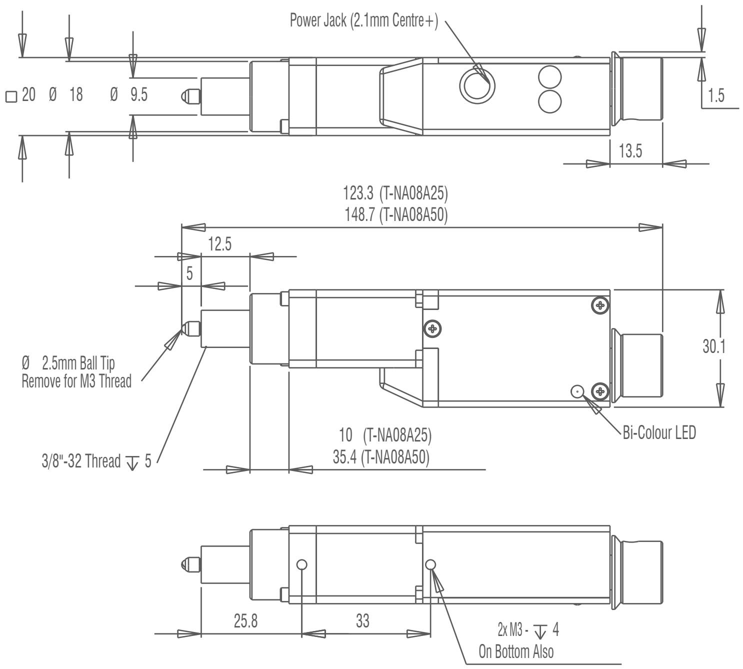
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. An industry standard 3/8″ (9.5 mm) diameter micrometer shank allows the T-NA to fit many popular stages. The plunger of the T-NA actuator does not rotate.

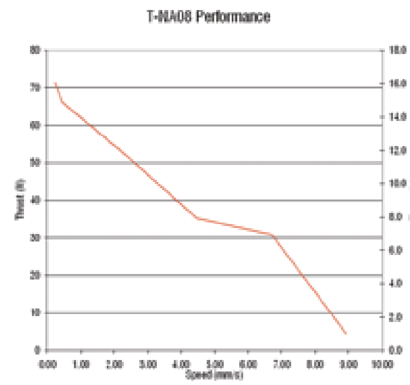
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the actuator reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the actuator's position is constantly transmitted to the computer and is displayed by the software.





Miniature Linear Actuators: T-NA *

Model †	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Weight (kg)
T-NA08A25	25.4	0.048	+/- 8	< 1	< 4	0.22	8	0.13
T-NA08A50	50.8	0.048	+/- 8	< 1	< 4	0.22	8	0.15

* Additional specs available at www.zaber.com

† More compact versions with no potentiometer available

I first had a vision of the Zaber Console while rowing off the coast of Malaysia. My firm but sweaty grip on the oars gave me complete control of the delicate, oaken craft: the kind of control I wanted to give to Zaber's customers. As I explored the hidden waterways of those mangrove swamps, my mind was exploring the commands and settings of Zaber's devices, finding the hidden design principles that unite them all into a functional and consistent whole. By the time I returned to the sun-baked shore, I held in my mind a shining cathedral of software. I have laboured since that day to erect a shrine where weary travelers can simplify motion control.

– Don "Peterman" Kirkby, Software Developer, Zaber Technologies



- **Integrated motor and controller**
- **Standard mounting interface replaces most manual micrometers**
- **Manual control knob lets you move the actuator at variable speeds**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-LA linear actuators are computer controlled, with up to 60 mm travel and 0.1 μm resolution.

T-LA actuators keep their position even with no power applied, and if the actuator is idle, power to the motor is automatically removed so it can stay cool.

Installation

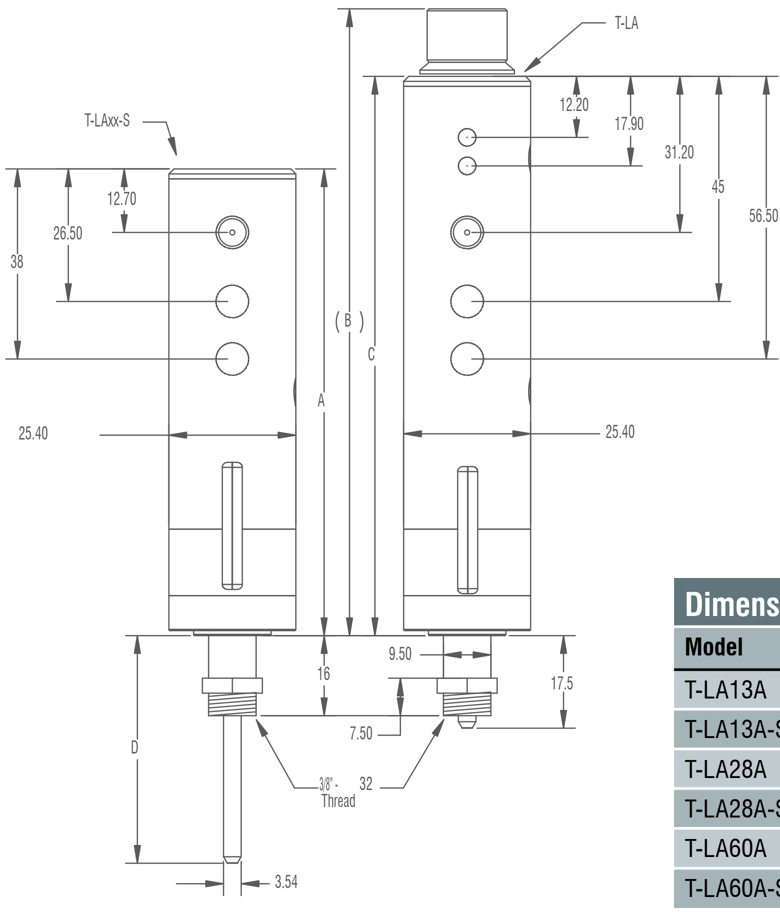
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. An industry standard 3/8″ (9.5 mm) diameter micrometer shank allows the T-LA to fit many popular stages. The plunger of the T-LA actuator does not rotate.

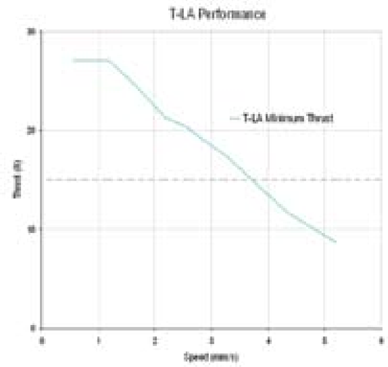
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the actuator reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the actuator's position is constantly transmitted to the computer and is displayed by the software.





Dimensions

Model	A (mm)	B (mm)	C (mm)	D (mm)
T-LA13A	N/A	125.5	111.8	30.5
T-LA13A-S	93.3	N/A	N/A	30.5
T-LA28A	N/A	125.5	111.8	45.5
T-LA28A-S	93.3	N/A	N/A	45.5
T-LA60A	N/A	160.5	146.8	77.5
T-LA60A-S	128.3	N/A	N/A	77.5

Miniature Linear Actuators: T-LA *

Model †	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Weight (kg)
T-LA13A	13	0.0992	+/- 12	< 1	< 6	0.93	4	0.14
T-LA28A	28	0.0992	+/- 12	< 1	< 6	0.93	4	0.14
T-LA60A	60	0.0992	+/- 16	< 1	< 6	0.93	4	0.15

* Additional specs available at www.zaber.com

† More compact versions with no potentiometer available

I finally got a chance to work with the Zaber stages we ordered a while ago. I am very impressed – the documentation is excellent, and the devices actually work like they are supposed to, and they reply to commands as documented. A real pleasure!

– Martin Grill, Research Engineer, SRI International



- **Compact size: great for applications with limited space**
- **Resolution down to 0.024 μm**
- **Designed for use with A-MCA stepper motor controllers**
- **Threaded tip for multiple mounting options**

The LAC linear actuators are Zaber's most compact actuators. They have a resolution of 0.024 μm and a travel length of 10 mm. Each actuator comes with a hardened ball tip that you can remove if you prefer to use the built-in threaded tip (M3) or a flat tip.

Installation

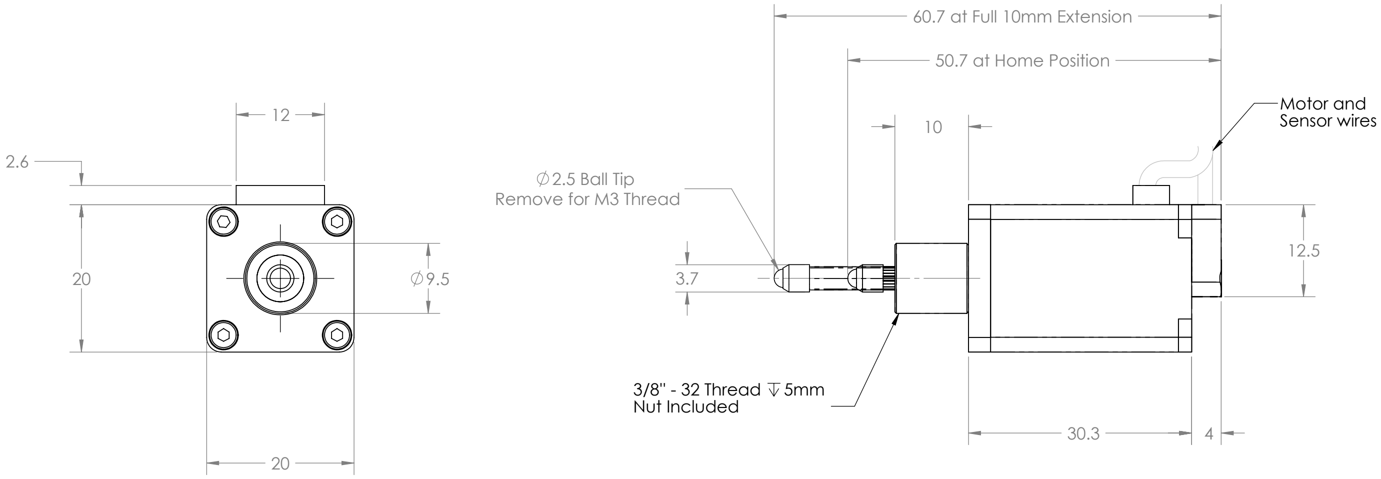
The LAC series actuators are designed to connect directly to Zaber's A-MCA stepper motor controller (purchased separately). A-MCA controllers can be daisy-chained with any of Zaber's A-Series or T-Series products.

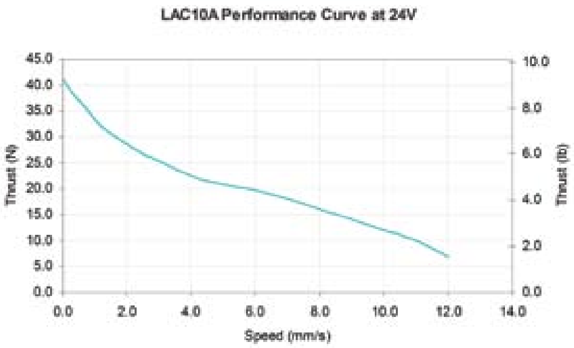
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position of the actuator. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

The indexed knob of the A-MCA stepper motor controller provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.





Compact Motorized Actuators: LAC *

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Weight (kg)
LAC10A-T4	10	0.0238125	+/- 6	1.5	2	0.0145	12	0.05

* Additional specs available at www.zaber.com

A big part of what I like about working at Zaber is getting to know customers and learning about their new and novel applications. In particular, designing custom products for OEMs can be a fulfilling experience. It's exciting seeing customers' products become successful with Zaber's devices inside.

– Jesse Schuhlein, Senior Product Manager, Zaber Technologies



- **Available in several sizes for a variety of thrusts and speeds**
- **Resolution down to 0.05 μm**
- **Designed for use with A-MCA stepper motor controllers**
- **Threaded tip for multiple mounting options**

Zaber's NA actuators offer a wide range of size, thrust, and speed options not available in our actuators with built-in controllers. The NA series actuators are available with travel ranges from 16 mm to 60 mm and thrust up to 1450 N (325 lb), and they have a threaded tip for push/pull operation.

Installation

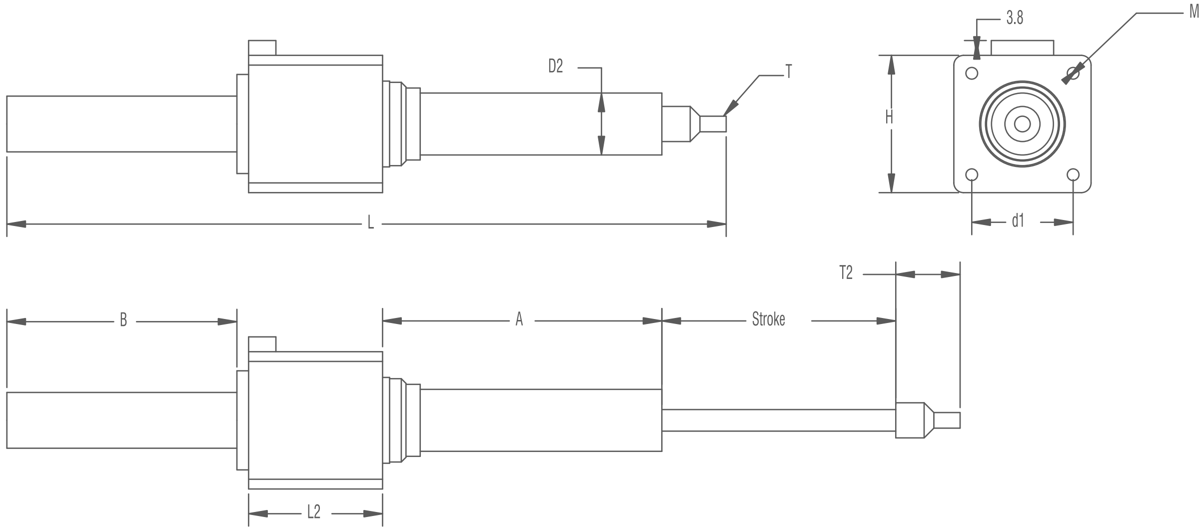
The NA series actuators are designed to connect directly to Zaber's A-MCA stepper motor controller (purchased separately). A-MCA controllers can be daisy-chained with any of Zaber's T-Series or A-Series products.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position of the actuator. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

The indexed knob of the A-MCA stepper motor controller provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.



Dimensions

Model	A (mm)	B (mm)	L (mm)	d1 (mm)	D2 (mm)	H (mm)	L2 (mm)	M *	T	T2 (mm)
NA08x16-T4	20.5	18.7	80.2	15.4	9	20	27	M2	#4-40	11.5
NA08x30-T4	33	32.7	106.7	15.4	9	20	27	M2	#4-40	11.5
NA11B16-T4	26.8	16	86.9	23	14	28.2	32.2	M2.5	M3	8.8
NA11B30-T4	39.5	28	111.4	23	14	28.2	32.2	M2.5	M3	8.8
NA11B60-T4	70.5	60.6	175.9	23	14	28.2	32.2	M2.5	M3	8.8
NA14B16-T4	25.8	16	95.8	26	15.9	35.2	34.4	M3	M4	16.5
NA14B30-T4	38.6	29	121.5	26	15.9	35.2	34.4	M3	M4	16.5
NA14B60-T4	70.2	60.4	183.1	26	15.9	35.2	34.4	M3	M4	16.5
NA23C60-T4	74.5	65.5	208.4	47.1	28	56.4	45.2	5.2	1/4″-20	22.1
NA34C60-T4	80	65.5	266.2	69.3	40	86.3	78.6	6.5	7/16″-14	38.6

* In NA08, NA11, and NA14 models, “M” is a threaded hole; in NA23 and NA34 models, “M” is a through-hole (diameter given in mm)

Motorized Linear Actuators: NA *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Weight (kg)
NA08A16-T4	16	0.047625	+/- 25	< 20	< 15	0.447	14	0.06
NA08A30-T4	30	0.047625	+/- 25	< 20	< 15	0.447	14	0.07
NA08B16-T4	16	0.09525	+/- 25	< 20	< 15	0.893	28	0.06
NA08B30-T4	30	0.09525	+/- 25	< 20	< 15	0.893	28	0.07
NA11B16-T4	16	0.09921875	+/- 25	< 5	< 15	0.930	28	0.14
NA11B30-T4	30	0.09921875	+/- 25	< 5	< 15	0.930	28	0.15
NA11B60-T4	60	0.09921875	+/- 25	< 5	< 15	0.930	28	0.16
NA14B16-T4	16	0.09525	+/- 30	< 5	< 20	0.893	28	0.14
NA14B30-T4	30	0.09525	+/- 30	<5	< 20	0.893	28	0.21
NA14B60-T4	60	0.09525	+/- 30	< 5	< 20	0.893	28	0.22
NA23C60-T4	60	0.1984375	+/- 40	< 5	< 30	0.930	50	0.74
NA34C60-T4	60	0.1984375	+/- 55	< 10	< 35	0.930	30	2.63

* Additional specs available at www.zaber.com



- Integrated motor and controller
- Very compact with high speed, thrust, and accuracy
- 10 kg load capacity
- Up to 29 mm/s speed and up to 55 N thrust

Zaber's T-LSM miniature motorized translation stages are computer controlled and have high thrust and speed capabilities for such a compact size. At only 21 mm high, they are perfect for applications where a low profile is required. Zaber's innovative stage design allows speeds up to 29 mm/s and loads up to 10 kg. These stages are ready for assembly in XY or XYZ configuration with no additional hardware required. See Multi-Axis section for more information.

Installation

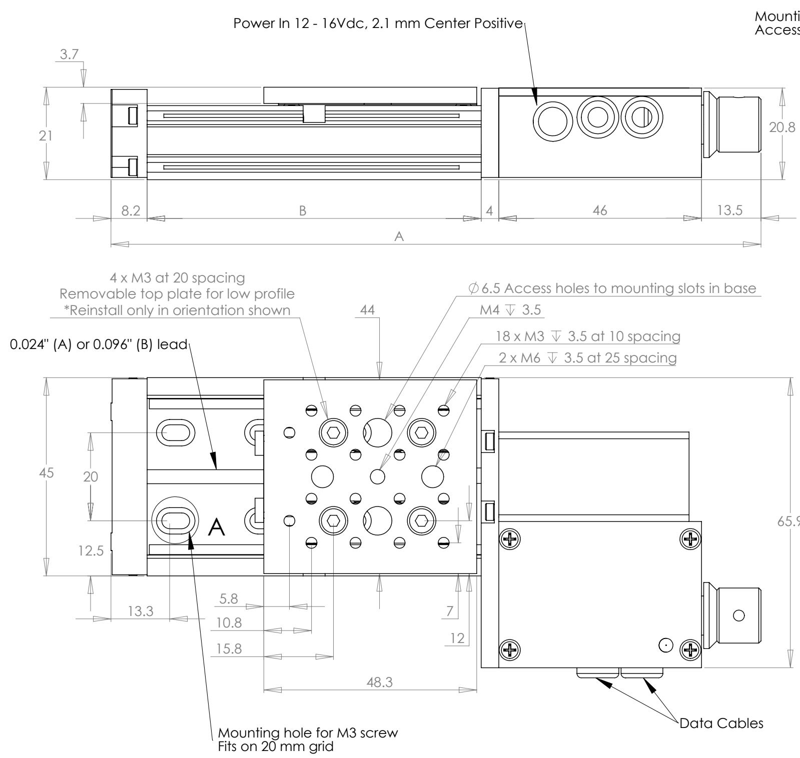
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

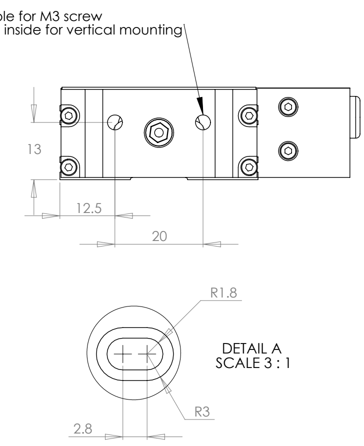
Computer Control

We provide free software so you can easily control your Zaber devices. Zaber's intuitive Windows software makes it easy to control the speed and position of the unit and change the device settings. After completing a move command, the stage will report its position through the RS-232 link. Built-in scripting allows you to easily set up complex automation routines. For LabVIEW users, we offer a free, certified LabVIEW driver. For a detailed list of available commands see the user's manual.

Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.

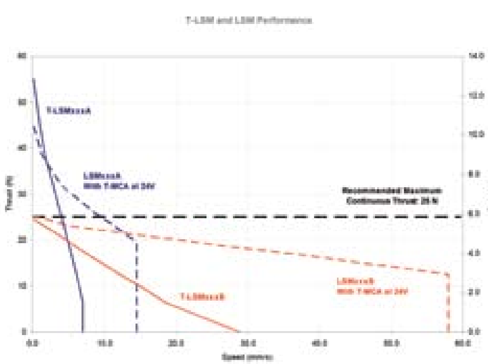




Model Number	A	B
T-LSM025	147.5	75.8
T-LSM050	172.9	101.2
T-LSM100	223.7	152.0
T-LSM150	274.5	202.8
T-LSM200	325.3	253.6

*Subtract 13.5 mm knob length from 'A' for -S versions without manual control

Zaber T-LSM Motorized Translation Stage dimensions in mm





Motorized Linear Stages: T-LSM *

Model †	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Continuous Thrust (N)	Weight (kg)
T-LSM025A	25.4	0.048	+/- 4	< 1	< 3	7	100	300	25	0.31
T-LSM025B	25.4	0.19	+/- 9	< 4	< 13	29	100	300	21	0.31
T-LSM050A	50.8	0.048	+/- 8	< 1	< 3	7	100	300	25	0.32
T-LSM050B	50.8	0.19	+/- 13	< 4	< 13	29	100	300	21	0.32
T-LSM100A	101.6	0.048	+/- 16	< 1	< 3	7	100	300	25	0.35
T-LSM100B	101.6	0.19	+/- 21	< 4	< 13	29	100	300	21	0.35
T-LSM150A	152.4	0.048	+/- 24	< 1	< 3	7	100	300	25	0.39
T-LSM150B	152.4	0.19	+/- 29	< 4	< 13	29	100	300	21	0.39
T-LSM200A	203.2	0.048	+/- 32	< 1	< 3	7	100	300	25	0.42
T-LSM200B	203.2	0.19	+/- 37	< 4	< 13	29	100	300	21	0.42

* Additional specs available at www.zaber.com

† Faster, externally controlled versions available; more compact versions with no potentiometer available



- **Compact size: great for applications with limited space**
- **10 mm travel**
- **Designed for use with A-MCA stepper motor controllers**
- **Easily mounts in XY and XYZ configurations**

Zaber's LSA series stages are designed to fit into the smallest spaces without sacrificing performance or features. Small but powerful, these stages have up to 10 mm/s speed and up to 3.5 kg thrust. With a microstep size of less than 25 nm and less than 1 μm repeatability, they allow for reliable ultra-fine positioning.

The LSA stages are wired with a male D-sub 15 connector for plug-and-play use with our A-MCA series stepper motor controllers. Our handy kits include free software and all of the accessories that you will need to get the stage running right out of the box.

Installation

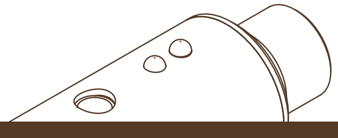
The LSA series stages are designed to connect directly to Zaber's A-MCA stepper motor controller (purchased separately). A-MCA controllers can be daisy-chained with any of Zaber's T-Series or A-Series products.

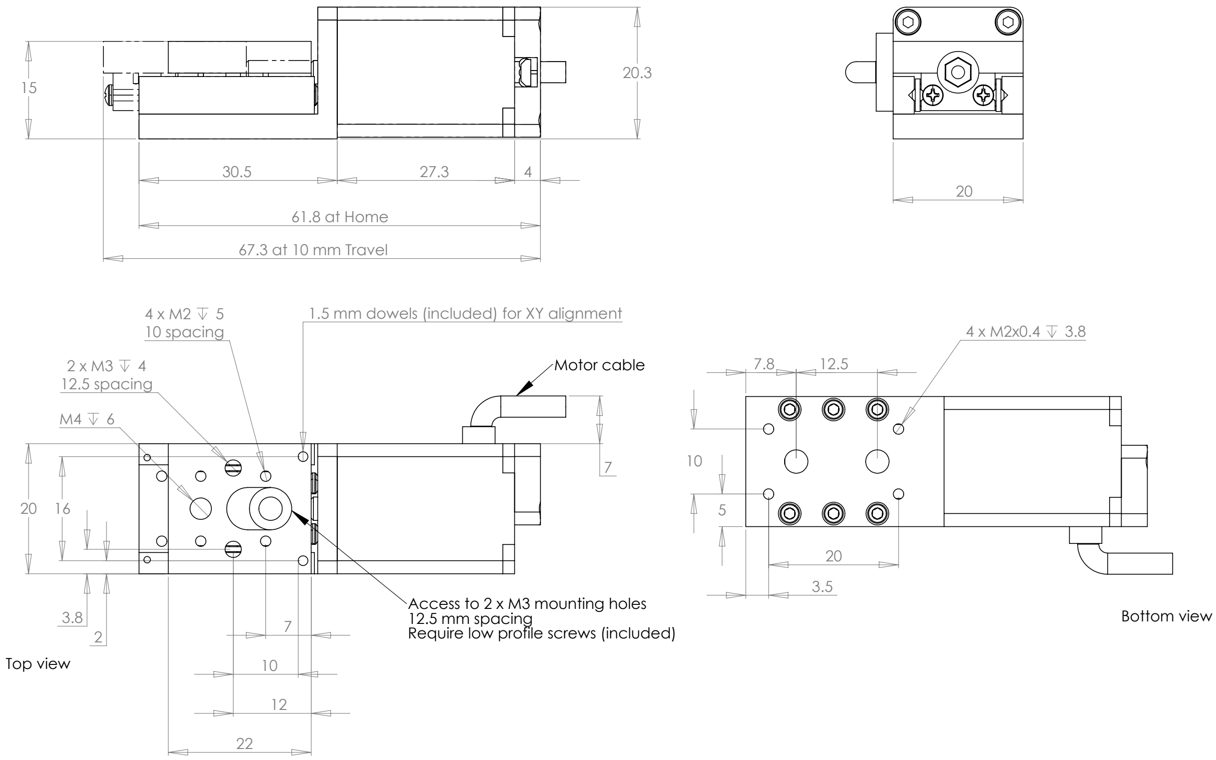
Computer Control

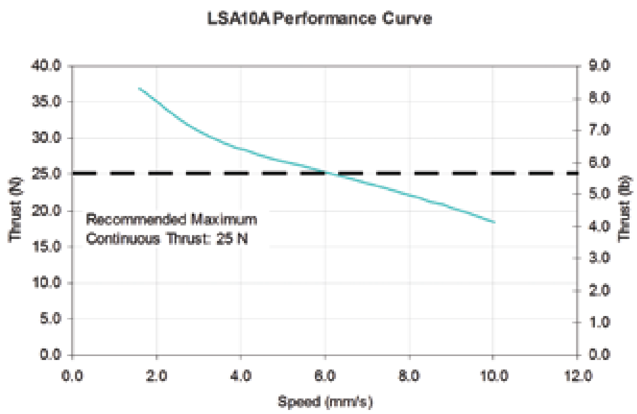
We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position of the actuator. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

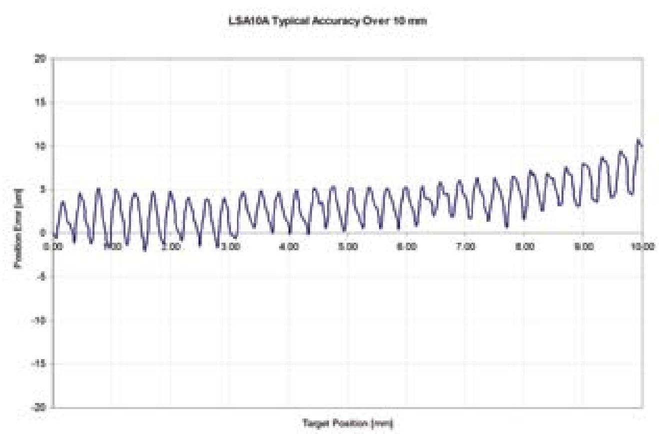
Manual Control

The indexed knob of the A-MCA stepper motor controller provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.









Micro Motorized Linear Stages: LSA *

Model †	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Continuous Thrust (N)	Weight (kg)
LSA10A-T4	10	0.0238	+/- 10	< 1	< 3	10	20	100	25	0.12

* Additional specs available at www.zaber.com



- **Integrated stage, motor, and controller**
- **Mount multiple stages in XY or XYZ configuration**
- **Daisy-chain and control multiple stages through a single serial port**
- **Manual control knob lets you move the stage at variable speeds**

Zaber's T-LS motorized linear translation stages are computer controlled, have 0.1 μm resolution, and have either 13 mm or 28 mm travel. They mount together in XY configuration (without an angle bracket) or in XYZ configuration with our AB90 angle bracket. See Multi-Axis section for more information.

Installation

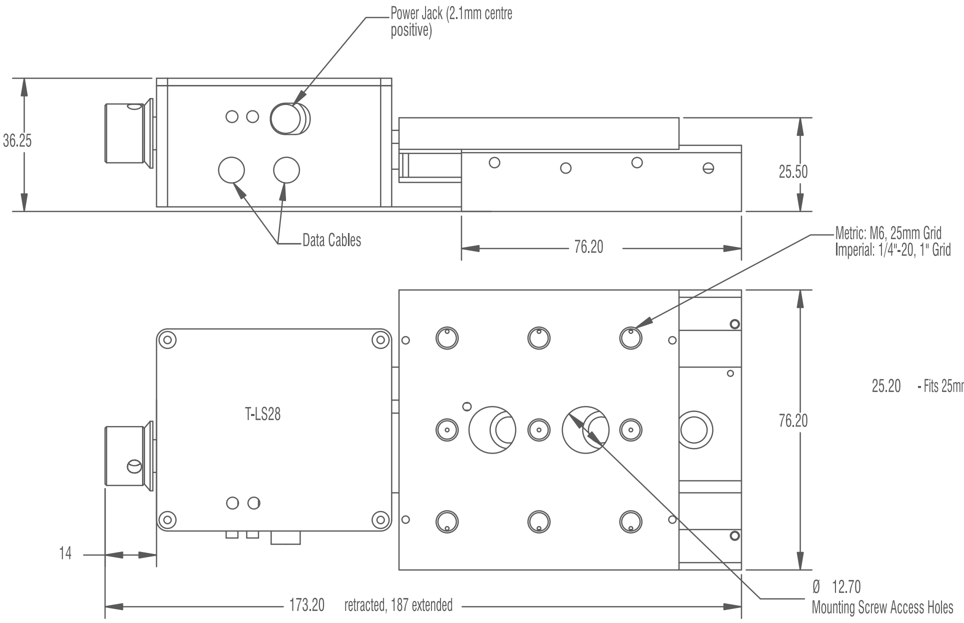
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

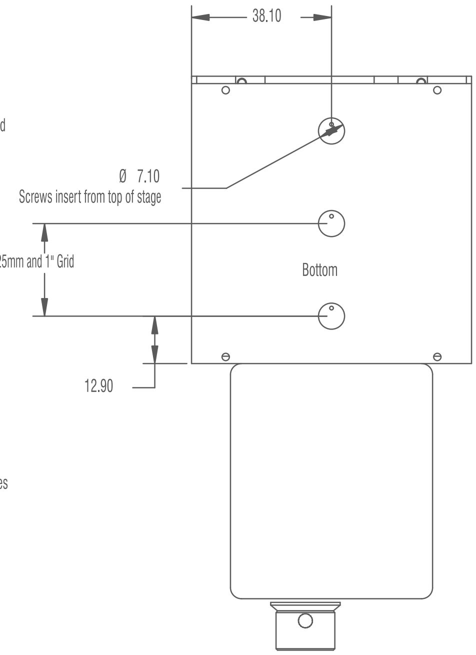
Computer Control

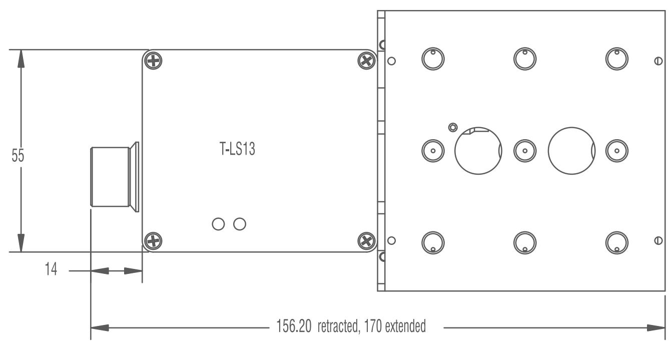
We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

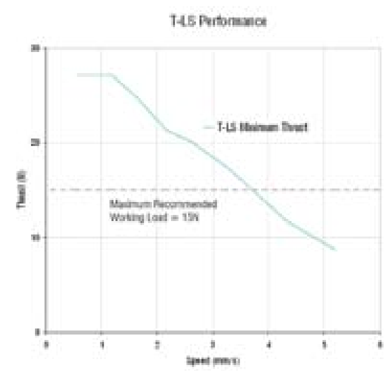
Manual Control

An optional knob permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.









Motorized Linear Stages: T-LS *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeat-ability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Thrust (N)	Weight (kg)
T-LS13E	13	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13M	13	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13E-S	13	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS13M-S	13	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.57
T-LS28E	28	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28M	28	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28E-S	28	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.59
T-LS28M-S	28	0.099	+/- 15	< 0.4	< 4	0.93	4	100	125	15	0.59

* Additional specs available at www.zaber.com



- **Integrated motor and controller**
- **Daisy-chain and control multiple devices through a single serial port**
- **Ready to assemble in XY or XYZ configuration**

Zaber's T-LSR motorized linear slides are computer controlled and have travel ranges from 75 mm up to 450 mm. These slides are available with various lead-screw pitches so you can select the device with the resolution and speed capability that you need. Zaber's innovative slide design is capable of speeds up to 80 mm/s, and can support loads up to 20 kg. These slides are ready for assembly in XY or XYZ configuration with no additional hardware required. See Multi-Axis section for more information.

Installation

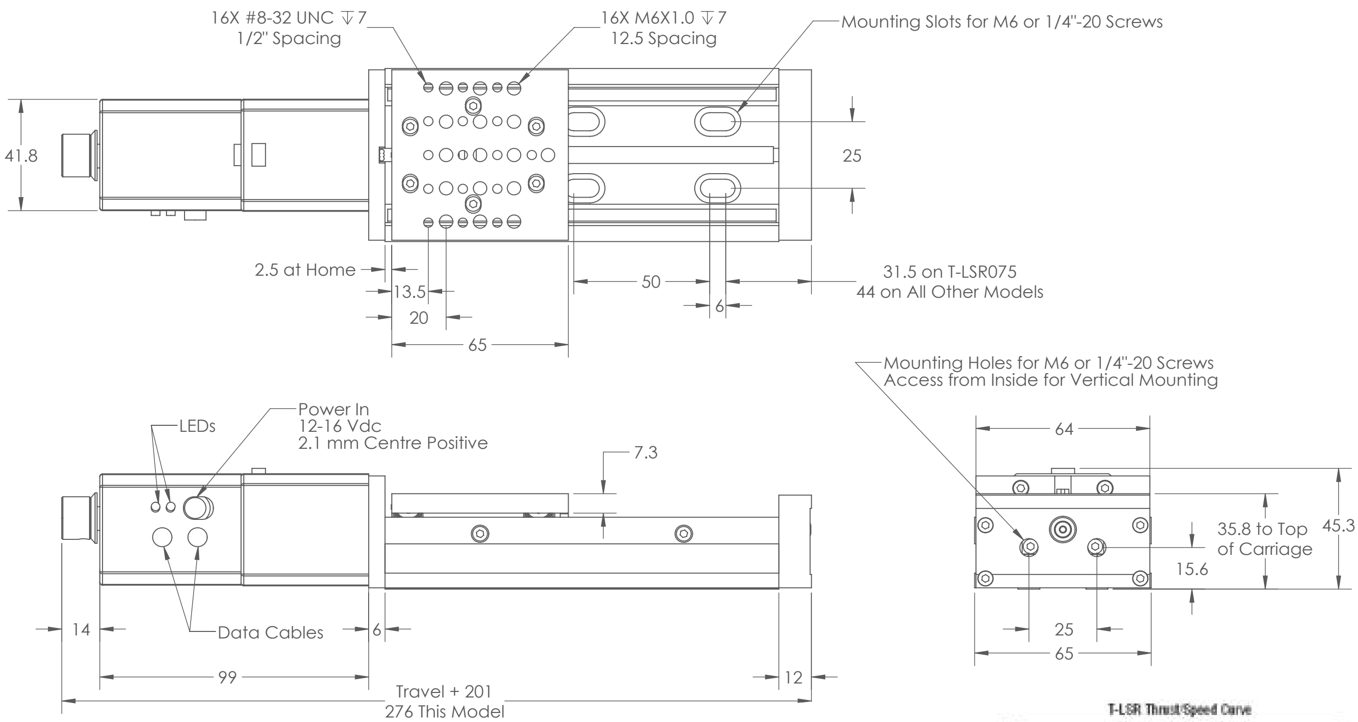
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the slide allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

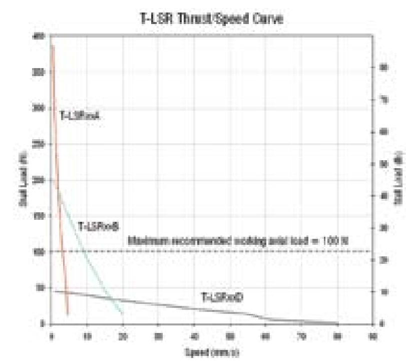
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the slide reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the slide's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the slide even without a computer.





Motorized Linear Slides: T-LSR *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Weight (kg)
T-LSR075A	75	0.099	+/- 12	< 2.5	< 5	0.93	4	200	800	1.2
T-LSR075B	75	0.496	+/- 8	< 2.5	< 7	4.65	20	200	800	1.2
T-LSR075D	75	1.984	+/- 20	< 3	< 20	18.6	80	200	800	1.2
T-LSR150A	150	0.099	+/- 23	< 2.5	< 5	0.93	4	200	800	1.4
T-LSR150B	150	0.496	+/- 8	< 2.5	< 7	4.65	20	200	800	1.4
T-LSR150D	150	1.984	+/- 20	< 3	< 20	18.6	80	200	800	1.4
T-LSR300A	300	0.099	+/- 45	< 2.5	< 5	0.93	4	200	800	1.8
T-LSR300B	300	0.496	+/- 15	< 2.5	< 7	4.65	20	200	800	1.8
T-LSR300D	300	1.984	+/- 20	< 3	< 20	18.6	80	200	800	1.8
T-LSR450A	450	0.099	+/- 68	< 2.5	< 5	0.93	4	200	800	2.3
T-LSR450B	450	0.496	+/- 23	< 2.5	< 7	4.65	20	200	800	2.3
T-LSR450D	450	1.984	+/- 23	< 3	< 20	18.6	80	200	800	2.3

* Additional specs available at www.zaber.com



- **Integrated motor and controller**
- **20 kg load capacity**
- **Up to 1 m/s speed and up to 100 N thrust**

Zaber's A-LSQ motorized linear stages are computer controlled and have travel ranges from 75 mm up to 600 mm. These stages are available with various lead-screw pitches so you can select the device with the resolution and speed capability that you need. Zaber's innovative stage design is capable of speeds up to 1 m/s and can support loads up to 20 kg. These stages are ready for assembly in XY or XYZ configuration with no additional hardware required. See Multi-Axis section for more information.

Installation

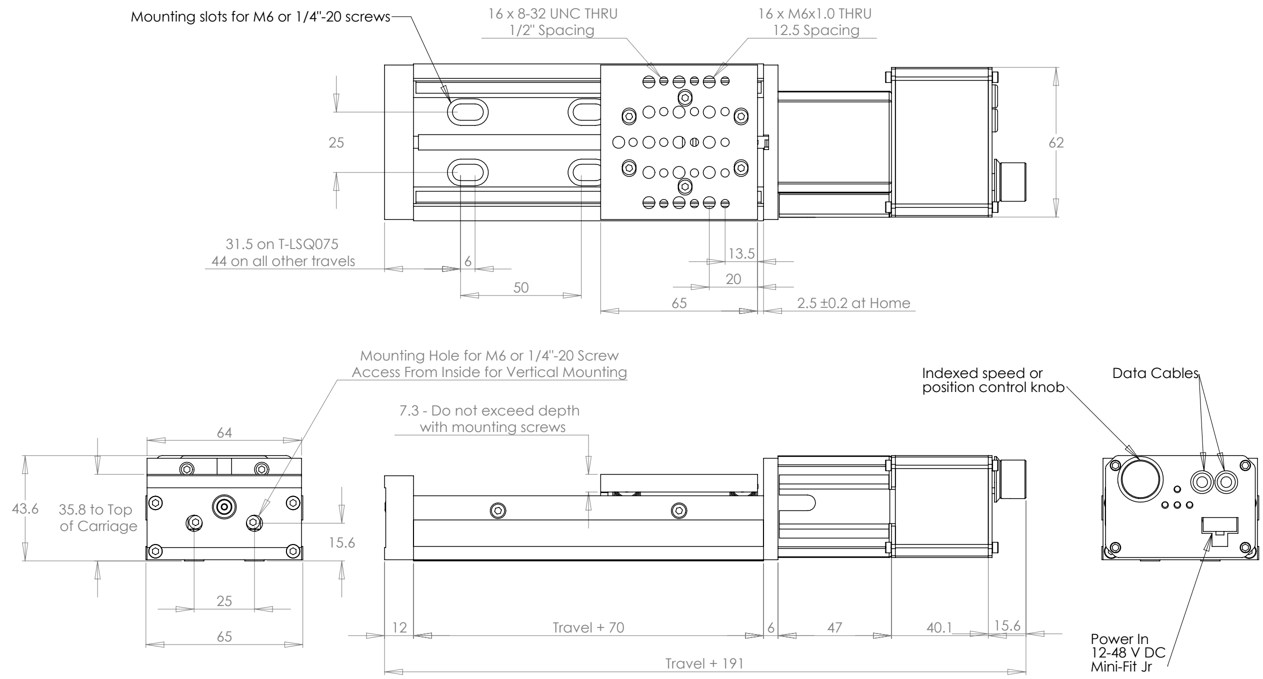
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

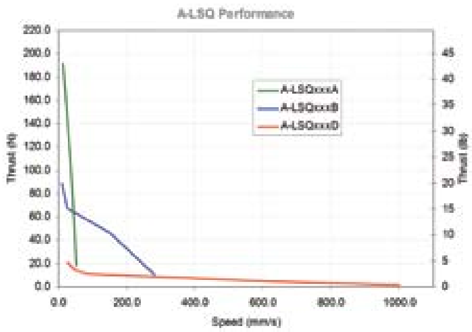
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.





Motorized Linear Stages: A-LSQ *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Weight (kg)
A-LSQ075A	75	0.099	23	< 2.5	< 5	0.93	53	200	800	1.2
A-LSQ075B	75	0.496	16	< 2.5	< 7	4.65	280	200	800	1.2
A-LSQ075D	75	1.984	40	< 3	< 20	18.6	1000	200	800	1.2
A-LSQ150A	150	0.099	46	< 2.5	< 5	0.93	53	200	800	1.4
A-LSQ150B	150	0.496	16	< 2.5	< 7	4.65	280	200	800	1.4
A-LSQ150D	150	1.984	40	< 3	< 20	18.6	1000	200	800	1.4
A-LSQ300A	300	0.099	90	< 2.5	< 5	0.93	53	200	800	1.8
A-LSQ300B	300	0.496	30	< 2.5	< 7	4.65	280	200	800	1.8
A-LSQ300D	300	1.984	40	< 3	< 20	18.6	1000	200	800	1.8
A-LSQ450A	450	0.099	136	< 2.5	< 5	0.93	53	200	800	2.3
A-LSQ450B	450	0.496	46	< 2.5	< 7	4.65	280	200	800	2.3
A-LSQ450D	450	1.984	46	< 3	< 20	18.6	1000	200	800	2.3
A-LSQ600A	600	0.099	150	< 2.5	< 5	0.93	42	200	800	2.9
A-LSQ600B	600	0.496	150	< 2.5	< 7	4.65	225	200	800	2.9
A-LSQ600D	600	1.984	150	< 3	< 20	18.6	800	200	800	2.9

* Additional specs available at www.zaber.com



- **Integrated motor, encoder, and controller**
- **Encoder position feedback with slip/stall detection and automatic recovery**
- **Up to 1 m/s travel speed**

Zaber's A-LSQ-E stages are computer controlled and come with integrated rotary feedback encoders. Stage travel ranges are from 75 mm to 600 mm. A built-in encoder allows closed-loop operation and slip/stall recovery features. Zaber's innovative stage design allows for speeds up to 1 m/s and loads up to 20 kg. These stages are ready for assembly in XY or XYZ configuration with no additional hardware required. See Multi-Axis section for more information.

Closed-Loop Operation

A-LSQ-E stages use built-in rotary encoders to provide position verification. Upon detection of any slipping or stalling, the stages report the stall and can be set to automatically recover their position. Several modes of recovery behaviour are available.

Installation

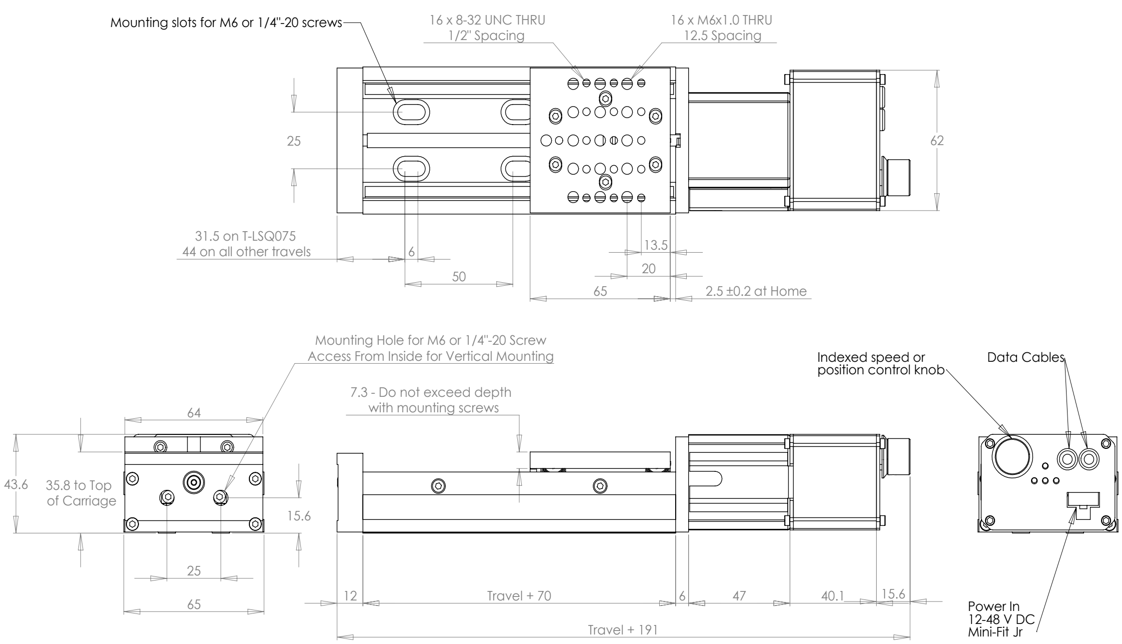
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

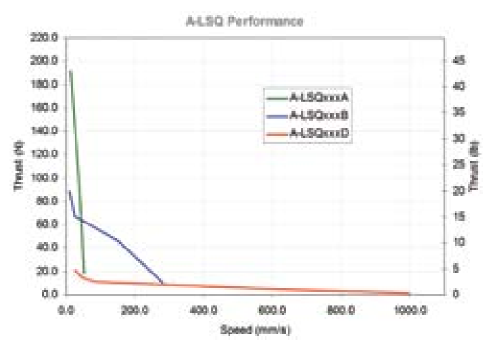
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.





Closed-Loop Motorized Linear Stages: A-LSQ-E *

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (µm)	Minimum Speed (µm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Thrust (N)	Weight (kg)
A-LSQ075A-E01	75	0.099	23	< 2.5	< 5	0.061	53	200	147	1.2
A-LSQ075B-E01	75	0.496	16	< 2.5	< 7	0.303	280	200	75	1.2
A-LSQ075D-E01	75	1.984	40	< 3	< 20	1.211	1000	200	18	1.2
A-LSQ150A-E01	150	0.099	46	< 2.5	< 5	0.061	53	200	147	1.4
A-LSQ150B-E01	150	0.496	16	< 2.5	< 7	0.303	280	200	75	1.4
A-LSQ150D-E01	150	1.984	40	< 3	< 20	1.211	1000	200	18	1.4
A-LSQ300A-E01	300	0.099	90	< 2.5	< 5	0.061	53	200	147	1.8
A-LSQ300B-E01	300	0.496	30	< 2.5	< 7	0.303	280	200	75	1.8
A-LSQ300D-E01	300	1.984	40	< 3	< 20	1.211	1000	200	18	1.8
A-LSQ450A-E01	450	0.099	136	< 2.5	< 5	0.061	53	200	147	2.3
A-LSQ450B-E01	450	0.496	46	< 2.5	< 7	0.303	280	200	75	2.3
A-LSQ450D-E01	450	1.984	46	< 3	< 20	1.211	1000	200	18	2.3
A-LSQ600A-E01	600	0.099	150	< 2.5	< 5	0.061	42	200	147	2.9
A-LSQ600B-E01	600	0.496	150	< 2.5	< 7	0.303	225	200	75	2.9
A-LSQ600D-E01	600	1.984	150	< 3	< 20	1.211	800	200	18	2.9

* Additional specs available at www.zaber.com

Closed-Loop, Belt-Driven, Motorized Linear Stages: A-BLQ-E



- **Many travel ranges, from 70 mm to 2095 mm**
- **Up to 2 m/s speed, 18 N thrust, and 20 kg load capacity**
- **Encoder position feedback with slip/stall detection and automatic recovery**

Zaber's A-BLQ-E stages are computer controlled and come with integrated rotary feedback encoders. With travel lengths up to 2.1 m and a maximum speed of 2.0 m/s, A-BLQ-E stages are perfect for rapid positioning over large distances. Their high load capacity and excellent torsional stiffness make them suitable for large payloads, while 10 μm repeatability allows these stages to be used for precise positioning as well.

Closed-Loop Operation

A-BLQ-E stages use built-in rotary encoders to provide position verification. Upon detection of any slipping or stalling, the stages report the stall and can be set to automatically recover their position. Several modes of recovery behaviour are available.

Installation

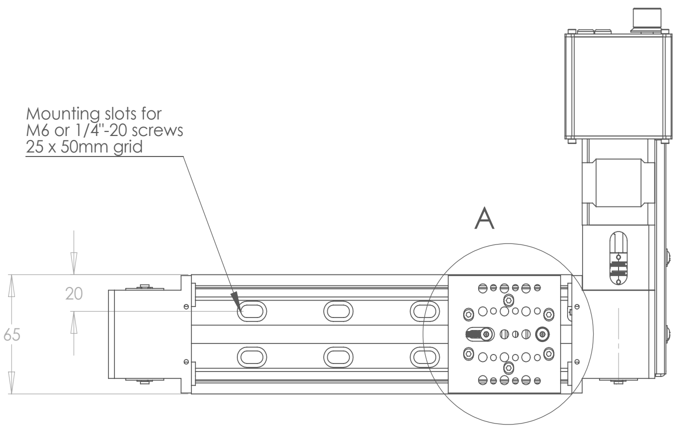
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

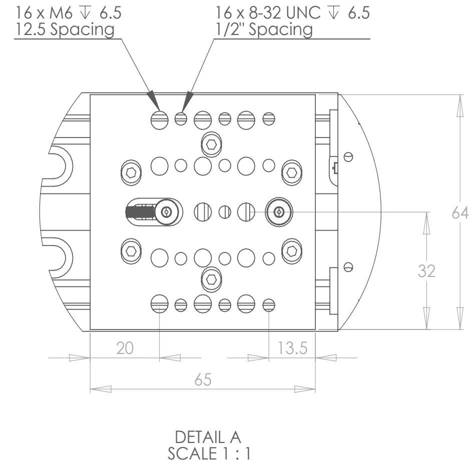
Computer Control

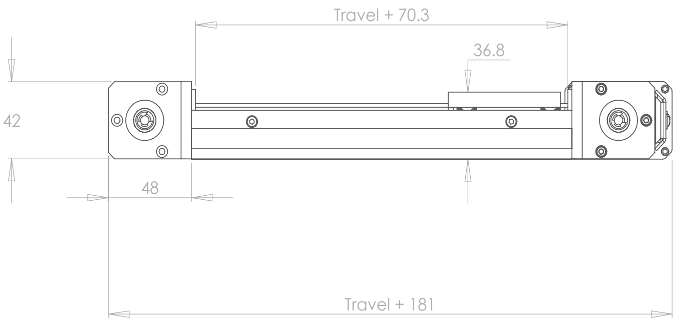
We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

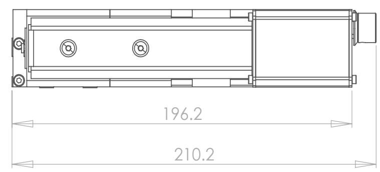
Manual Control

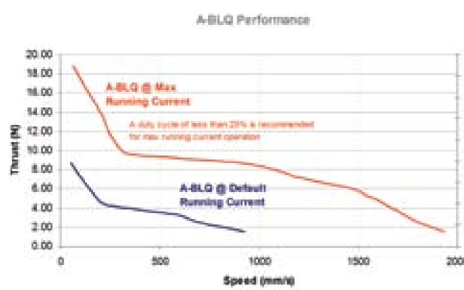
Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.











Closed-Loop, Belt-Driven, Motorized Linear Stages: A-BLQ-E *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Minimum Speed (mm/s)	Maximum Speed † (m/s)	Maximum Centred Load (N)	Maximum Thrust † (N)	Weight (kg)
A-BLQ0070-E01	70	4.2164	+/- 200	< 10	< 50	0.0026	1.1	200	18	1.42
A-BLQ0145-E01	145	4.2164	+/- 200	< 10	< 50	0.0026	1.6	200	18	1.58
A-BLQ0295-E01	295	4.2164	+/- 200	< 10	< 50	0.0026	2.0	200	18	1.91
A-BLQ0445-E01	445	4.2164	+/- 200	< 10	< 50	0.0026	2.0	200	18	2.20
A-BLQ0595-E01	595	4.2164	+/- 200	< 10	< 50	0.0026	2.0	200	18	2.60
A-BLQ1045-E01	1045	4.2164	+/- 300	< 10	< 50	0.0026	2.0	200	18	3.60
A-BLQ1495-E01	1495	4.2164	+/- 500	< 10	< 50	0.0026	2.0	200	18	4.11
A-BLQ2095-E01	2095	4.2164	+/- 750	< 10	< 50	0.0026	2.0	200	18	5.94

* Additional specs available at www.zaber.com

† Measured at maximum running current



- **Integrated motor and controller**
- **100 kg load capacity and up to 1500 mm travel**
- **Daisy-chain and control multiple devices through a single serial port**
- **Ready to assemble in XY configuration**

Zaber's A-LST linear stages are computer controlled and have travel ranges from 254 mm up to 1500 mm. These stages are available with various lead-screw pitches so you can select the device with the resolution and speed capability that you need. Zaber's innovative stage design is capable of speeds up to 420 mm/s, and can support loads up to 100 kg. These stages are ready for assembly in XY configuration with no additional hardware required. See Multi-Axis section for more information.

Installation

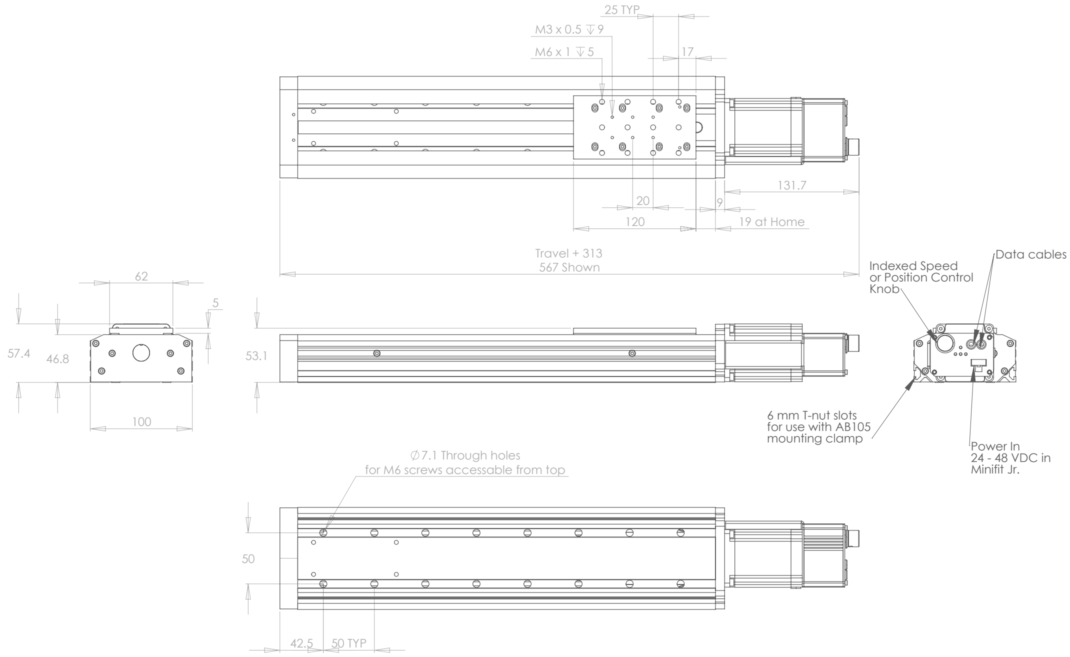
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

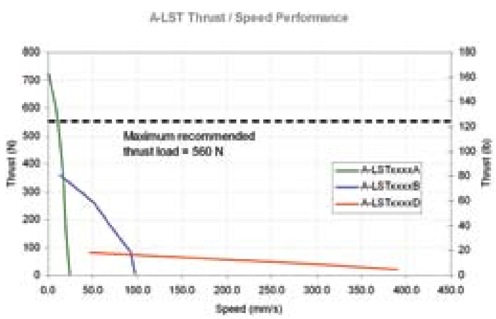
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.







High-Load Motorized Linear Stages: A-LST *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (No Load) (μm)	Maximum Speed (mm/s)	Maximum Thrust (N)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Weight (kg)
A-LST0250A	254	0.124	+/- 32	2	5	22	560	1000	3000	4.1
A-LST0250B	254	0.496	+/- 32	2	10	100	350	1000	3000	4.1
A-LST0250D	254	1.984	+/- 32	2.5	20	420	80	1000	3000	4.1
A-LST0500A	500	0.124	+/- 63	2	5	22	560	1000	3000	5.0
A-LST0500B	500	0.496	+/- 63	2	10	100	350	1000	3000	5.0
A-LST0500D	500	1.984	+/- 63	2.5	20	420	80	1000	3000	5.0
A-LST0750A	750	0.124	+/- 94	2	5	22	560	1000	3000	5.8
A-LST0750B	750	0.496	+/- 94	2	10	100	350	1000	3000	5.8
A-LST0750D	750	1.984	+/- 94	2.5	20	420	80	1000	3000	5.8
A-LST1000A	1000	0.124	+/- 125	2	5	22	560	1000	3000	6.9
A-LST1000B	1000	0.496	+/- 125	2	10	100	350	1000	3000	6.9
A-LST1000D	1000	1.984	+/- 125	2.5	20	420	80	1000	3000	6.9
A-LST1500A	1500	0.124	+/- 187	2	5	15	560	1000	3000	9.1
A-LST1500B	1500	0.496	+/- 187	2	10	60	350	1000	3000	9.1
A-LST1500D	1500	1.984	+/- 187	2.5	20	240	80	1000	3000	9.1

* Additional specs available at www.zaber.com



- **Integrated motor and controller**
- **100 kg load capacity and up to 1500 mm travel**
- **Daisy-chain and control multiple devices through a single serial port**
- **Flexible stainless steel dust cover**

Zaber's A-LST-C linear stages are computer controlled and have travel ranges from 254 mm up to 1500 mm. These stages are available with various lead-screw pitches so you can select the device with the resolution and speed capability that you need. Zaber's innovative stage design is capable of speeds up to 420 mm/s, and can support loads up to 100 kg. The flexible stainless steel dust cover protects the internal lead-screw and bearings.

Installation

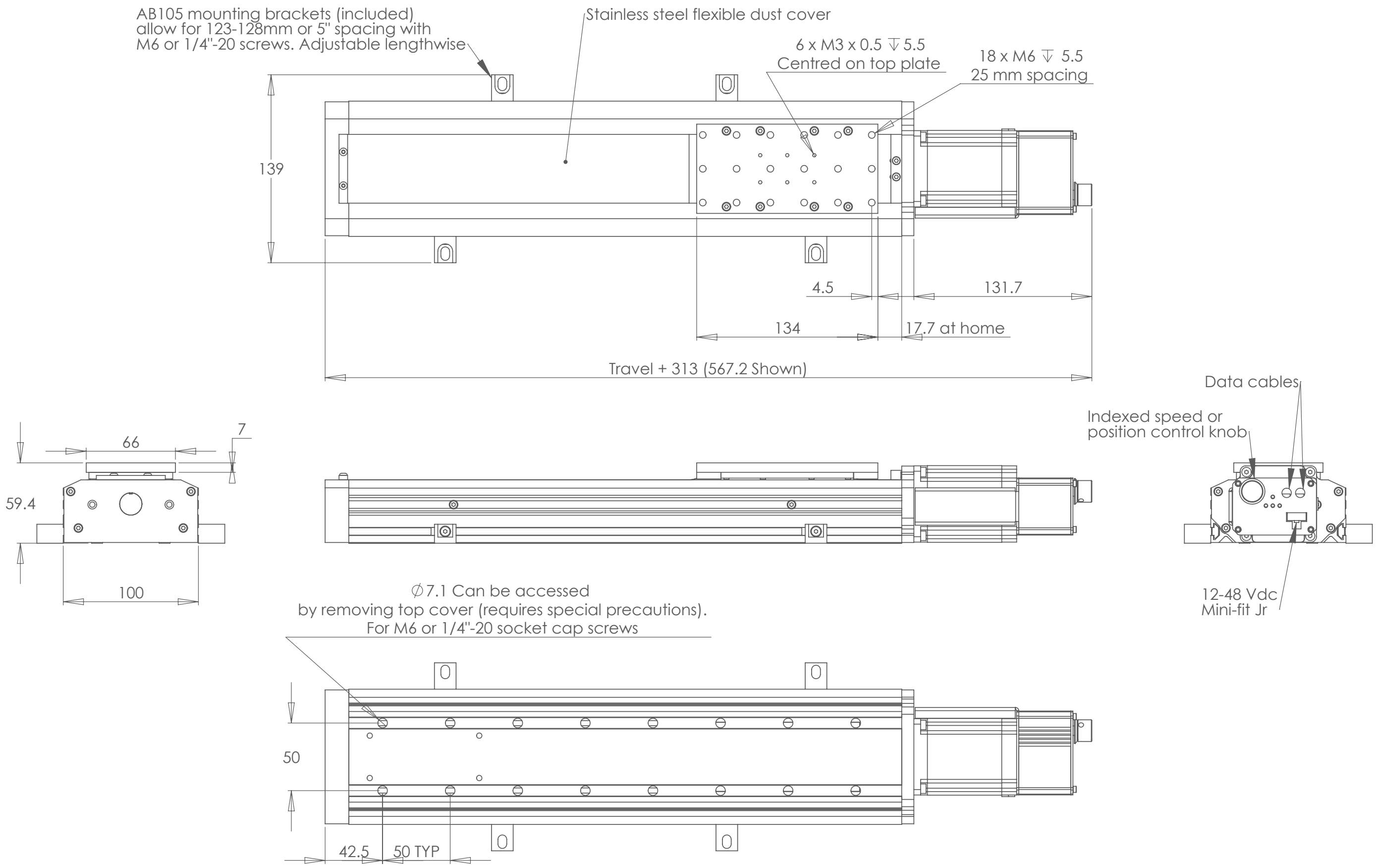
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. The knob allows for versatile control even without a computer.



Note: See performance and accuracy charts on p. 35

High-Load Motorized Linear Stages: A-LST-C *

Model	Travel Range (mm)	Microstep Size (Resolution) (µm)	Accuracy (µm)	Repeatability (µm)	Backlash (No Load) (µm)	Maximum Speed (mm/s)	Maximum Thrust (N)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Weight (kg)
A-LST0250A-C	254	0.124	+/- 32	2	5	22	560	1000	3000	4.3
A-LST0250B-C	254	0.496	+/- 32	2	10	95	350	1000	3000	4.3
A-LST0250D-C	254	1.984	+/- 32	2.5	20	385	80	1000	3000	4.3
A-LST0500A-C	500	0.124	+/- 63	2	5	22	560	1000	3000	5.2
A-LST0500B-C	500	0.496	+/- 63	2	10	95	350	1000	3000	5.2
A-LST0500D-C	500	1.984	+/- 63	2.5	20	385	80	1000	3000	5.2
A-LST0750A-C	750	0.124	+/- 94	2	5	22	560	1000	3000	6.1
A-LST0750B-C	750	0.496	+/- 94	2	10	95	350	1000	3000	6.1
A-LST0750D-C	750	1.984	+/- 94	2.5	20	385	80	1000	3000	6.1
A-LST1000A-C	1000	0.124	+/- 125	2	5	22	560	1000	3000	7.1
A-LST1000B-C	1000	0.496	+/- 125	2	10	95	350	1000	3000	7.1
A-LST1000D-C	1000	1.984	+/- 125	2.5	20	385	80	1000	3000	7.1
A-LST1500A-C	1500	0.124	+/- 187	2	5	15	560	1000	3000	9.3
A-LST1500B-C	1500	0.496	+/- 187	2	10	60	350	1000	3000	9.3
A-LST1500D-C	1500	1.984	+/- 187	2.5	20	240	80	1000	3000	9.3

* Additional specs available at www.zaber.com



- **Integrated motor, encoder, and controller**
- **Encoder position feedback with slip/stall detection and automatic recovery**
- **Up to 420 mm/s travel speed and thrust up to 560 N**
- **Ready to assemble in XY configuration**

Zaber's A-LST-E high-load motorized stages are computer controlled with integrated controllers. Travel options range from 254 mm up to 1500 mm. A built-in encoder allows closed-loop operation and slip/stall recovery features. Zaber's innovative stage design is capable of speeds up to 420 mm/s, and can support loads up to 100 kg and cantilever loads up to 3000 N·cm.

Closed-Loop Operation

A-LST-E stages use built-in rotary encoders to provide position verification. Upon detection of any slipping or stalling, the stages report the stall and can be set to automatically recover their position. Several modes of recovery behaviour are available.

Installation

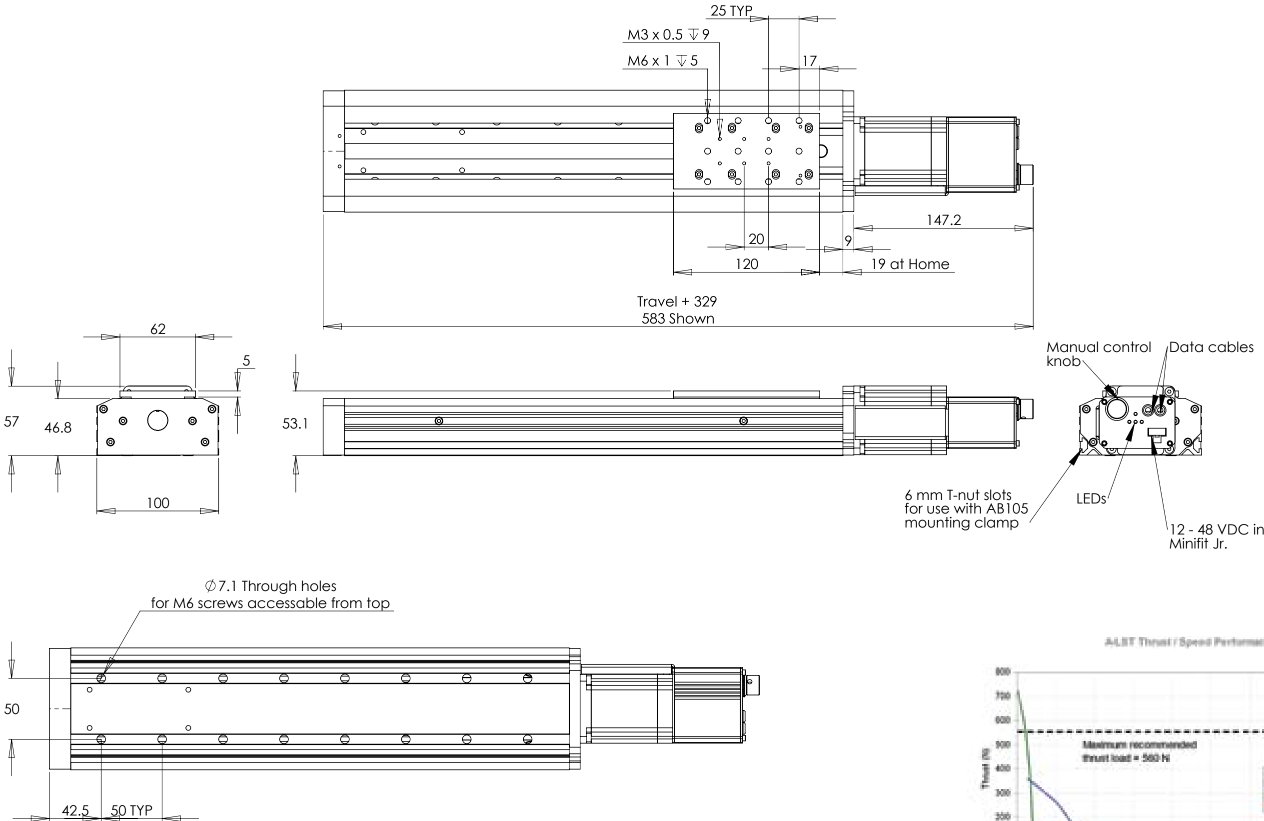
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port.

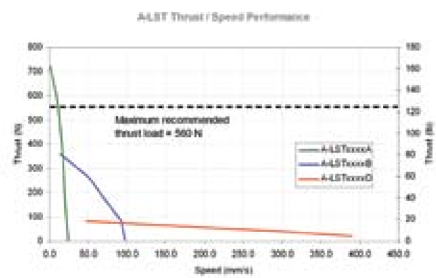
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Zaber's A-Series devices have an indexed knob that provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation.





Closed-Loop Motorized Linear Stages: A-LST-E *

Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (No Load) (μm)	Maximum Speed (mm/s)	Maximum Thrust (N)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Weight (kg)
A-LST0250A-E01	254	0.124	+/- 32	< 2	5	22	560	1000	3000	3.6
A-LST0250B-E01	254	0.496	+/- 32	< 2	10	100	350	1000	3000	3.6
A-LST0250D-E01	254	1.984	+/- 32	< 2.5	20	420	80	1000	3000	3.6
A-LST0500A-E01	500	0.124	+/- 63	< 2	5	22	560	1000	3000	4.7
A-LST0500B-E01	500	0.496	+/- 63	< 2	10	100	350	1000	3000	4.7
A-LST0500D-E01	500	1.984	+/- 63	< 2.5	20	420	80	1000	3000	4.7
A-LST0750A-E01	750	0.124	+/- 94	< 2	5	22	560	1000	3000	5.8
A-LST0750B-E01	750	0.496	+/- 94	< 2	10	100	350	1000	3000	5.8
A-LST0750D-E01	750	1.984	+/- 94	< 2.5	20	420	80	1000	3000	5.8
A-LST1000A-E01	1000	0.124	+/- 125	< 2	5	22	560	1000	3000	6.9
A-LST1000B-E01	1000	0.496	+/- 125	< 2	10	100	260	1000	3000	6.9
A-LST1000D-E01	1000	1.984	+/- 125	< 2.5	20	420	80	1000	3000	6.9
A-LST1500A-E01	1500	0.124	+/- 187	< 2	5	15	560	1000	3000	9.1
A-LST1500B-E01	1500	0.496	+/- 187	< 2	10	60	350	1000	3000	9.1
A-LST1500D-E01	1500	1.984	+/- 187	< 2.5	20	240	80	1000	3000	9.1

* Additional specs available at www.zaber.com

Motorized Dovetail Slides: T-LLS



- **Integrated slide, motor, and controller**
- **Ideal for single-axis motion up to 260 mm**
- **Daisy-chain and control multiple devices through a single serial port**
- **Manual control knob lets you move the slide at variable speeds**

Zaber's T-LLS dovetail slides are computer controlled and have 0.16 μm resolution. T-LLS slides are available in 105 mm and 260 mm travel ranges.

The T-LLS series is ideal for single-axis applications. For XY and XYZ configurations, we recommend our T-LS, T-LSM, T-LSR, A-LSQ, and A-LST motorized linear stages.

Installation

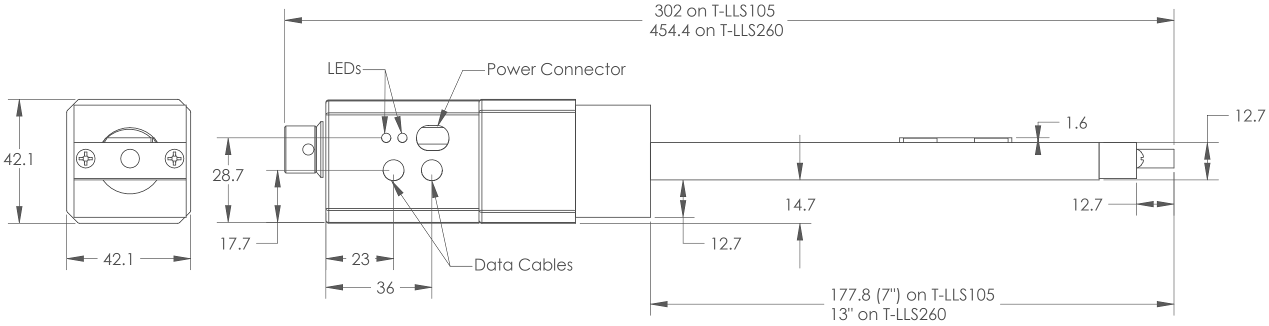
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the slide allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

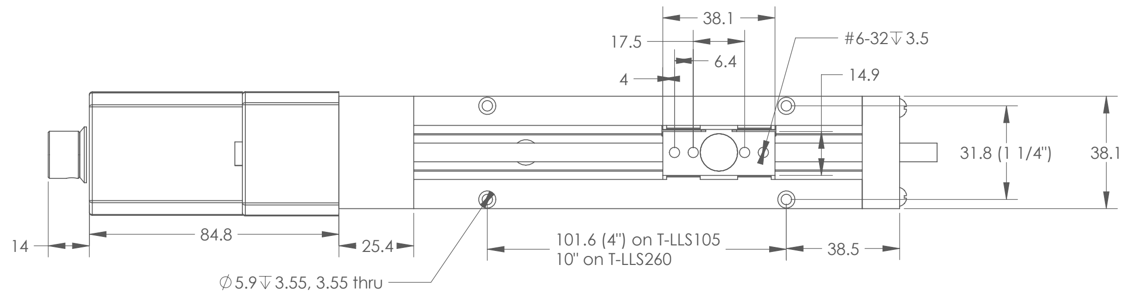
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the slide reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the slide's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the slide even without a computer.





Motorized Dovetail Slides: T-LLS *

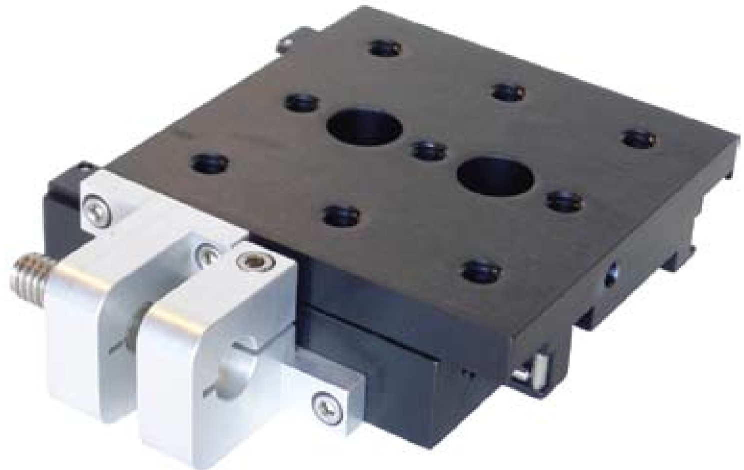
Model	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeat-ability (μm)	Backlash (μm)	Minimum Speed (μm/s)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Thrust (N)	Weight (kg)
T-LLS105	105	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	14	0.55
T-LLS105-S	105	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	14	0.55
T-LLS260	260	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	14	0.7
T-LLS260-S	260	0.156	+/- 15	< 0.5	< 16	1.4	6	14	80	14	0.7

* Additional specs available at www.zaber.com

My favourite part about working at Zaber is that everyone is very open-minded, supportive, and knowledgeable. While working on my Master of Business Administration (MBA) degree, I was frequently required to do assignments on my workplace. During that time, it was great to be able to approach my colleagues with ideas and questions about the company and our industry. Working with people who really supported my decision to further my studies made the whole process a lot easier.

– Bryan Cassidy, Director of Business Development, Zaber Technologies

Manual Translation Stages: TSB









- **Compatible with Zaber's manual micrometers and T-NA, T-LA, and NA11 actuators**
- **Available with a manual micrometer head**
- **Reversible mounting bracket allows left-hand or right-hand operation**
- **Brackets have a convenient clamping mechanism for easy adjustments**

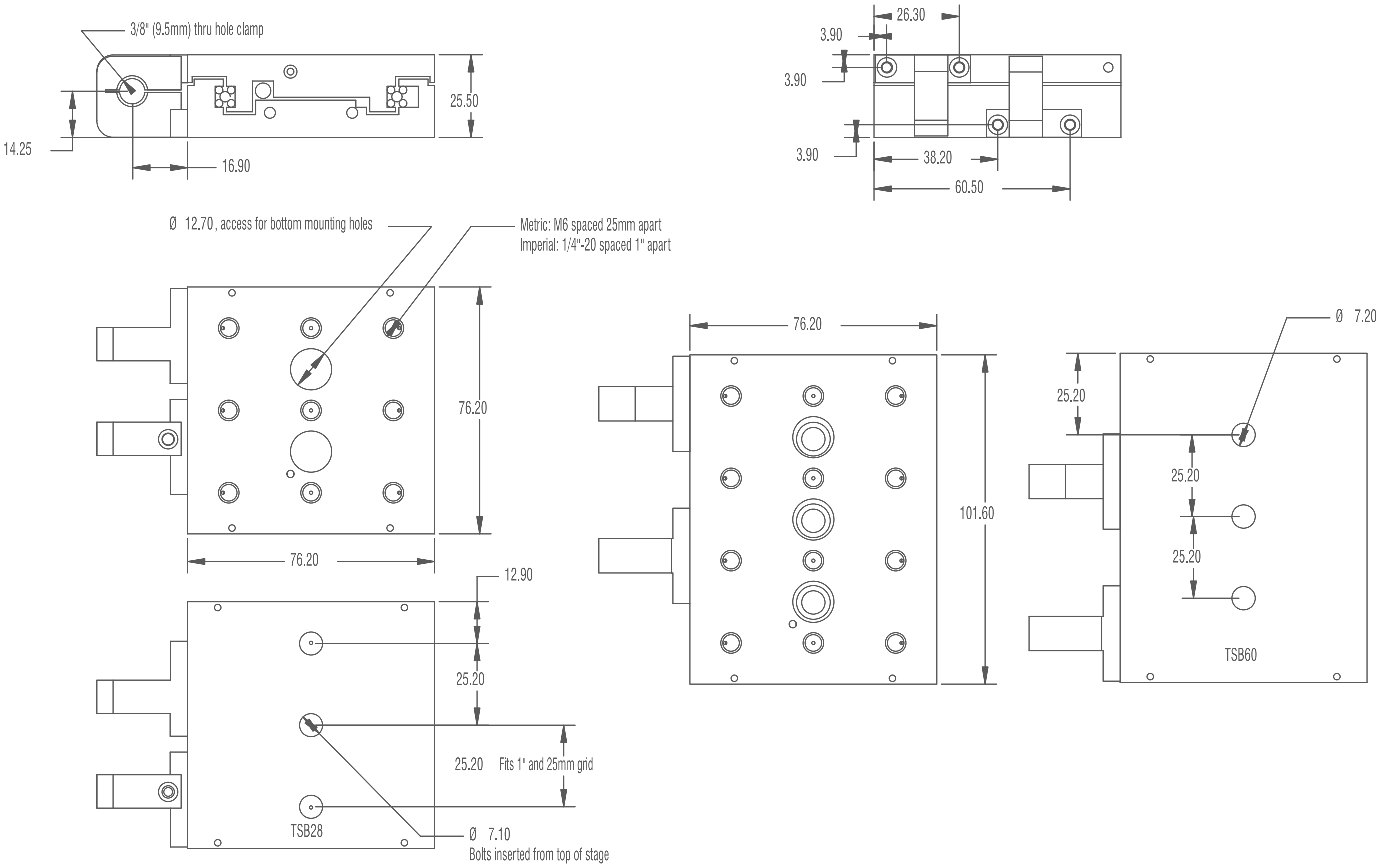
Zaber's TSB ball bearing translation stages without manual micrometer heads are available in two sizes, offering either 28 mm or 60 mm of travel. The versions with manual micrometer heads are also available in two sizes, offering either 25 mm or 50 mm of travel and 0.01 mm resolution.

The TSB translation stages can be mounted directly in XY configuration, or in XYZ configuration with an angle bracket. TSB stages ensure smooth and accurate motion: they are made from precision-machined anodized aluminum, with precision-ground rails and ball bearings. Choose from either metric M6 mounting holes on 25 mm spacing, or imperial 1/4″-20 mounting holes on 1″ spacing.

Installation

Each stage includes a pair of actuator mounting brackets that include a convenient clamping mechanism to grip actuators, and are easily adjusted or locked in place. The mounting brackets are compatible with Zaber actuators: the standard 9.5 mm brackets fit our T-NA and T-LA series of actuators; if you want to use our NA11 actuators, we offer optional 14 mm brackets. TSB stages can be mounted directly in XY configuration. Optional AB90 angle brackets are available for mounting in XYZ configuration.

The TSB28x-MH25 and TSB60x-MH50 stages come with the appropriate mounting bracket and a manual micrometer head.



Manual Translation Stages: TSB *

Model	Travel Range (mm)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Stage Parallelism (μm)	Manual Micrometer Head	Mounting Thread
TSB28E	28	100	125	< 100	No	1/4″-20
TSB28E-MH25	25	100	125	< 100	Yes	1/4″-20
TSB28M	28	100	125	< 100	No	M6
TSB28M-MH25	25	100	125	< 100	Yes	M6
TSB60E	60	100	125	< 100	No	1/4″-20
TSB60E-MH50	50	100	125	< 100	Yes	1/4″-20
TSB60M	60	100	125	< 100	No	M6
TSB60M-MH50	50	100	125	<100	Yes	M6

* Additional specs available at www.zaber.com

SpinX Technologies

www.spinx-technologies.com

The SpinX Lab integrates liquid handling, incubation, and detection of nanolitre assays into a bench-top instrument for applications in pre-clinical drug discovery ranging from assay development to compound profiling. Currently, in-house compound profiling is generally limited to a panel of less than a dozen assays in any project, largely because no existing instrument allows a wider panel to be performed in a convenient and cost-effective manner. SpinX Lab enables dozens of compounds to be tested in hundreds of conditions in a single run.



SpinX uses two dovetail motorized slides inside the SpinX Lab instrument, namely for accurate and repeatable positioning of optical elements. The accuracy and repeatability, the compactness, and the competitive pricing of Zaber's products were extremely attractive to us for this application. In addition, the integrated stepper motor controller coupled with the relatively simple control using RS-232 made the integration into our device straightforward.

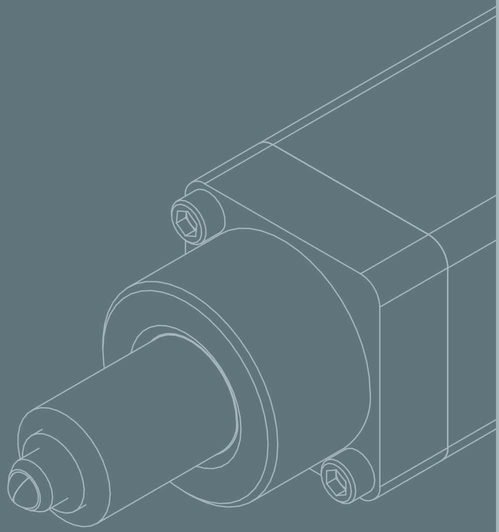
– SpinX Technologies







Rotary





- **Continuous 360° rotation stage with built-in controller**
- **Two lens holders allow for use as a polarizer mount**
- **20 kg load capacity, speed up to 8 rpm, torque up to 80 N·cm, 0.00023° resolution**
- **Through-hole for 1″ optics**

Zaber's T-RS60 rotary stages provide precise, continuous 360° rotation in a compact package. The robust bearing design allows the stage to handle up to 20 kg (44 lb) of load. Two options for worm gear ratios provide resolutions of 0.00023° or 0.00092°. The built-in controller makes set-up a snap: just connect the stage to a computer, and it is ready to use.

Installation

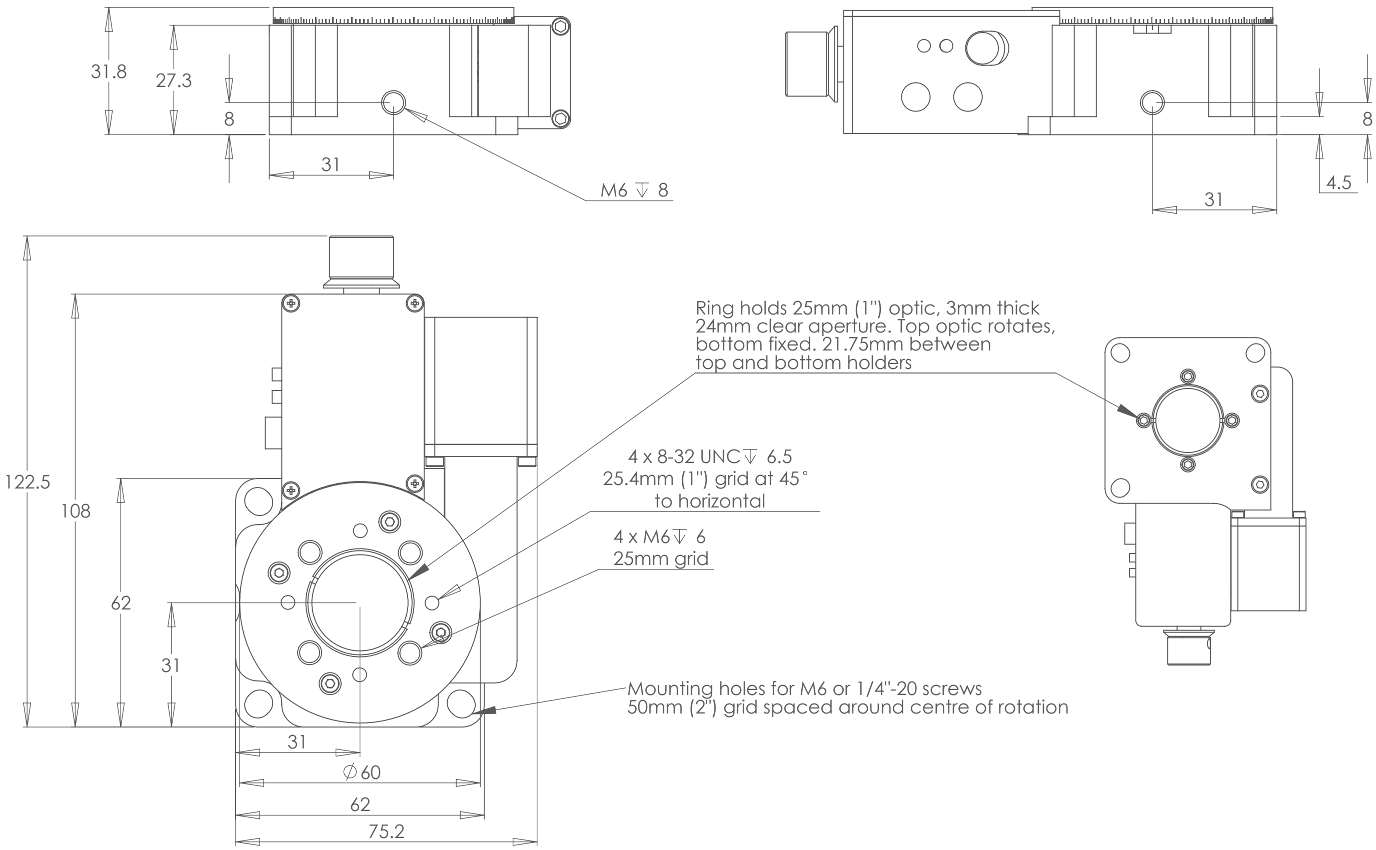
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

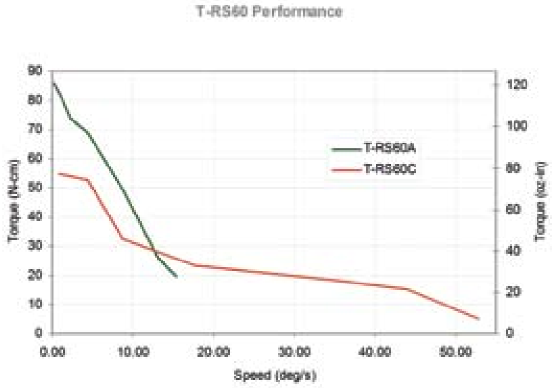
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the rotary stage even without a computer.





Motorized Rotary Stages: T-RS *

Model †	Microstep Size (Resolution) (°)	Maximum Centred Load (N)	Accuracy (°)	Repeatability (°)	Backlash (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Weight (kg)
T-RS60A	0.00023	200	+/- 0.05	< 0.02	< 0.06	0.0011	2.2	80	0.48
T-RS60C	0.00094	200	+/- 0.05	< 0.02	< 0.06	0.0044	8	55	0.48

* Additional specs available at www.zaber.com
† Faster, externally controlled versions available



- **Integrated motor and controller**
- **Manual control knob lets you move the stepper motor at variable speeds**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber's T-NM stepper motors are computer controlled and have 0.028° resolution. The stepper motor is matched to the built-in controller, so there's no need to fiddle with parameters.

Installation

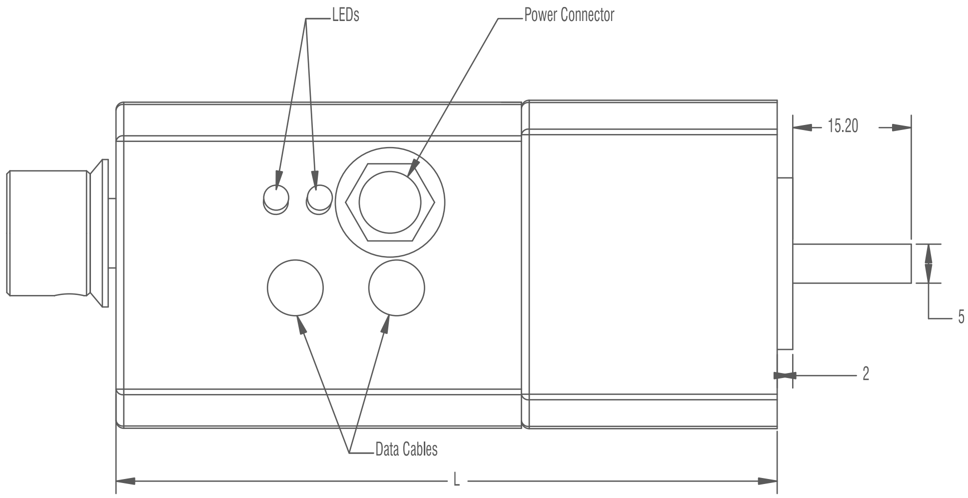
One or more T-NM devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port.

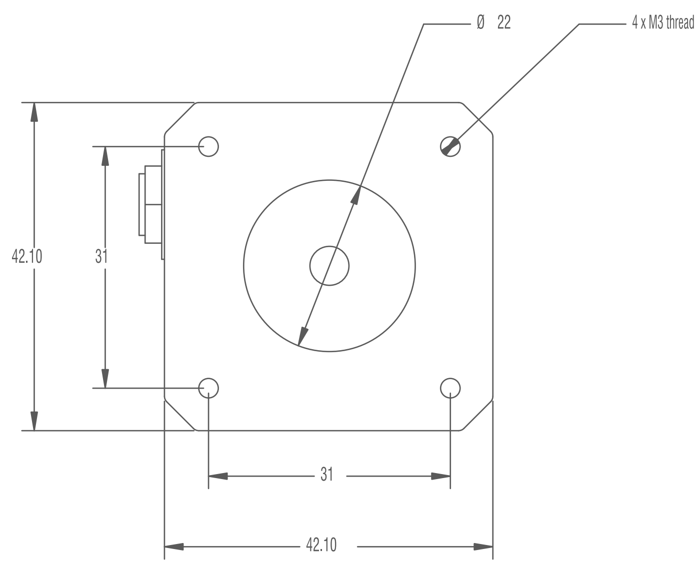
Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the device reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

An optional knob at the end of the unit permits smooth manual control at variable speeds. Turn the knob a little and the unit will move at its minimum speed, or turn it all the way for maximum speed. During a manual move the motor constantly transmits its position so the controlling computer can track it.





Dimensions	
Model	**L (mm)**
T-NM17A	84.8
T-NM17C	99

Stepper Motors with Built-In Controllers: T-NM *

Model	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Weight (kg)
T-NM17A04	0.0281	+/- 1	< 0.1	0.264	180	20.6	0.31
T-NM17A04-S	0.0281	+/- 1	< 0.1	0.264	180	20.6	0.31
T-NM17C04	0.0281	+/- 1	< 0.1	0.264	180	31.4	0.40
T-NM17C04-S	0.0281	+/-1	< 0.1	0.264	180	31.4	0.40

* Additional specs available at www.zaber.com



- **Available in several sizes for a variety of torques and speeds**
- **Resolution down to 0.028°**
- **Designed for use with T-MCA stepper motor controllers**

Zaber's NM stepper motors offer a wide range of size, torque, and speed options not available in our motors with built-in controllers. NM series motors are available with speeds up to 1440 rpm and torque up to 390 N·cm (552 oz·in).

Installation

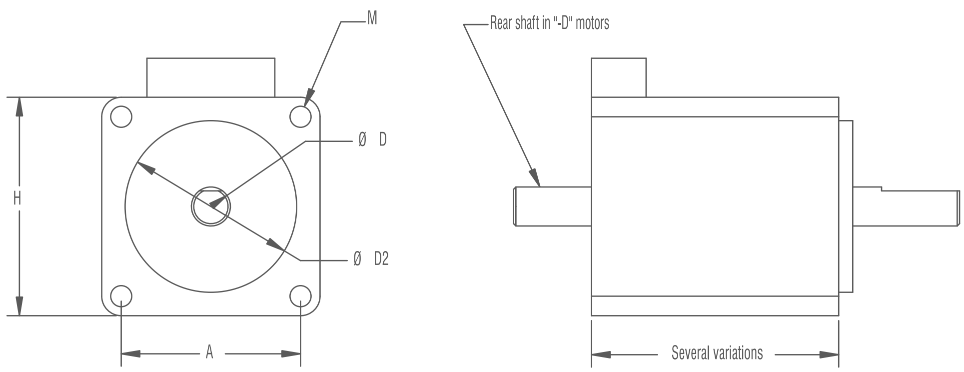
The NM series motors are designed to connect directly to our T-MCA stepper motor controllers (purchased separately). The T-MCA controllers can be daisy-chained with each other or any of Zaber's T-Series products.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob on the T-MCA controller permits smooth manual control at variable speeds in both directions. During a manual move the motor's position is constantly transmitted to the computer and is displayed by the software. The knob on the T-MCA controller allows you to use the NM motor even without a computer.



See www.zaber.com for details

Dimensions

Series	H (mm)	A (mm)	D (mm)	D2 (mm)	M
NM08	20	16	4	15	M2 thread
NM11	28	23	5	22	M2.5 thread
NM17	42.2	31	5	22	#4-40 thread
NM23	56.4	47.1	6.35	38.1	4.75 mm hole
NM34	85	69.6	12.7	73	6.5 mm hole

Stepper Motors: NM *

Series	Microstep Size (Resolution) (°)	Accuracy (°)	Minimum Speed (°/s)	Maximum Speed (rpm)	Maximum Torque (N·cm)	Current Rating (mA/phase)	Weight (kg)
NM08	0.0281	+/- 0.25	0.1318	Up to 1440	Up to 2.8	Up to 800	Up to 0.06
NM11	0.0281	+/- 0.25	0.1318	Up to 1440	Up to 12	Up to 670	Up to 0.20
NM17	0.0281	+/- 0.25	0.1318	Up to 1440	Up to 32	Up to 1200	Up to 0.35
NM23	0.0281	+/- 0.25	0.1318	Up to 1340	Up to 135	Up to 1000	Up to 1.00
NM34	0.0281	+/- 0.25	0.1318	Up to 725	Up to 390	Up to 2000	Up to 3.80

* Due to the large number of NM models available, this table shows data for each series rather than for individual models.
See www.zaber.com for more complete information on specific motors.

DigitalCameraInfo.com

www.digitalcamerainfo.com

DigitalCameraInfo.com features free, fun, and unbiased reviews to help people decide which digital camera would be best for them. Each DigitalCameraInfo.com review features a standard 44-point analysis that considers the camera's image quality, handling, portability, control, ease of use, and other key areas.

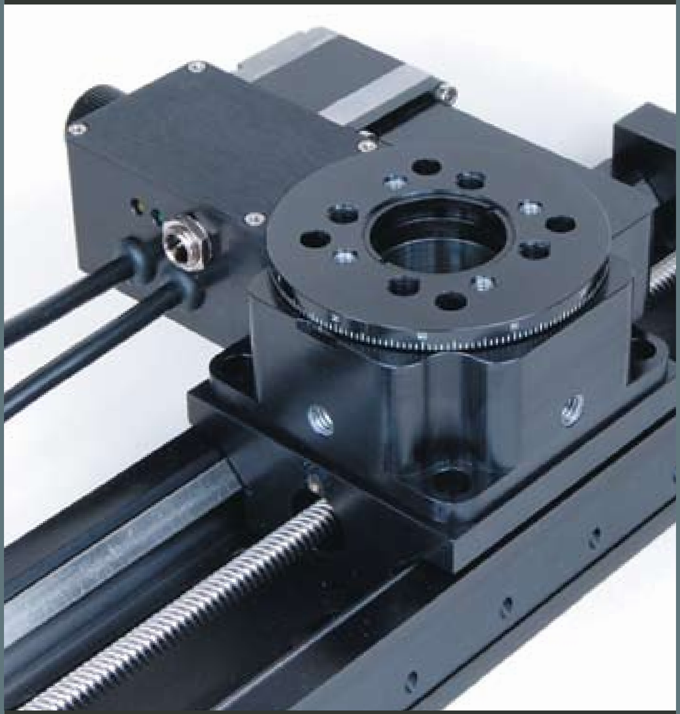
DigitalCameraInfo.com uses Zaber devices to test digital cameras and camcorders.



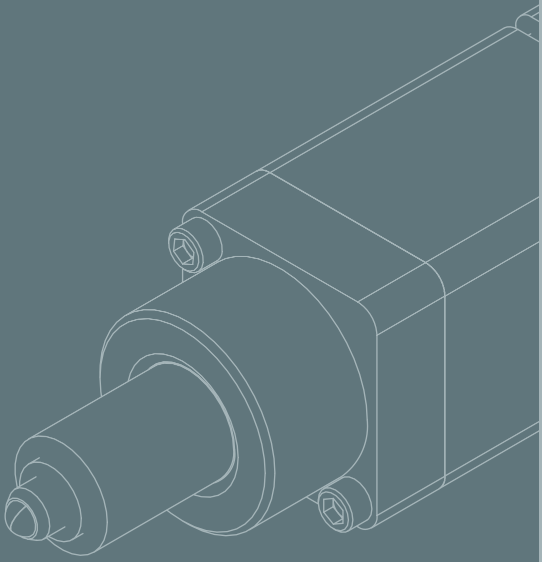
To test image stabilization, we use a T-LSR075A linear slide and a T-RS60C rotary stage, produced by the Canadian company Zaber. We mount the cameras and camcorders on these stands using a standard tripod mount. These devices allow us to apply shake to cameras and camcorders in a precisely controlled way, meaning that we can mimic human hand shake without the unpredictable nature of real humans. We use a custom Zaber script to control these devices to produce the required levels of movement to accurately mimic human hand shake.

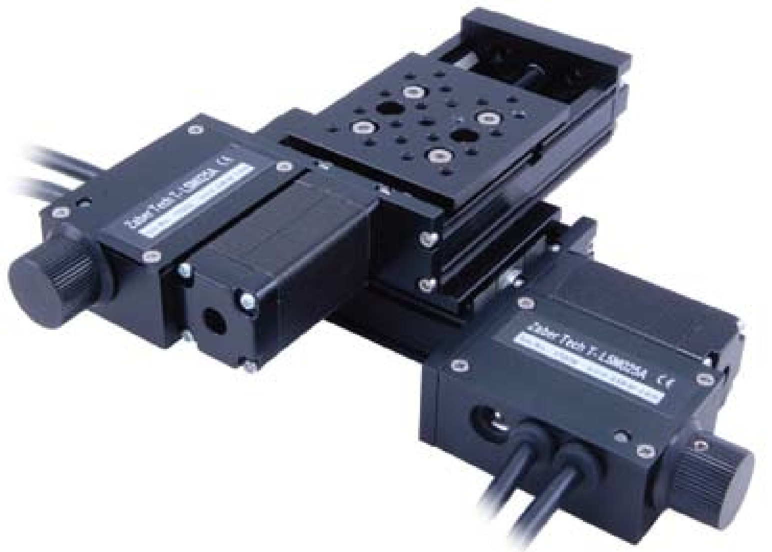
– DigitalCameraInfo.com





Multi-Axis





- **From 13 mm up to 1500 mm travel per axis**
- **Integrated motors and controllers**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber offers motorized stages that can be assembled into many different configurations of XY, XYZ, and XYZ/rotation. You can select your own combination of product family, travel, and lead-screw pitch in each axis to build the system you need. We ship multi-axis stages un-assembled to prevent damage to the moving parts. Our families of linear stages are listed on the next page. Please refer to the individual product family web pages for specifications.

Installation

One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like “move absolute”), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the stage’s position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.

Multi-Axis Systems: XY Series *

Zaber's XY systems are made up of two linear stages. They come packaged with all the accessories you will need to operate them in XY configuration. The stages in the XY series are powered by a standard power supply and connect to the RS-232 port of any computer. Following are some of the types of stages used in our XY systems, all of which mount directly in XY configuration – you can choose the combination of product family, travel, and lead-screw pitch to meet your needs.

T-LSM Miniature Linear Stages:
(shown in drawing)

- 25 to 200 mm travel †
- 10 kg maximum payload
- 25 N maximum thrust (vertical axis payload)

T-LSR Linear Slides:

- 75 to 450 mm travel †
- 20 kg maximum payload
- Up to 80 mm/s speed and up to 100 N thrust

T-LS Linear Stages:

- 13 and 28 mm travel
- 10 kg maximum payload
- 15 N maximum thrust (vertical axis payload)

A-LSQ Linear Stages:

- 75 to 600 mm travel †
- 20 kg maximum payload
- Up to 1 m/s speed and 100 N maximum thrust (vertical axis payload)

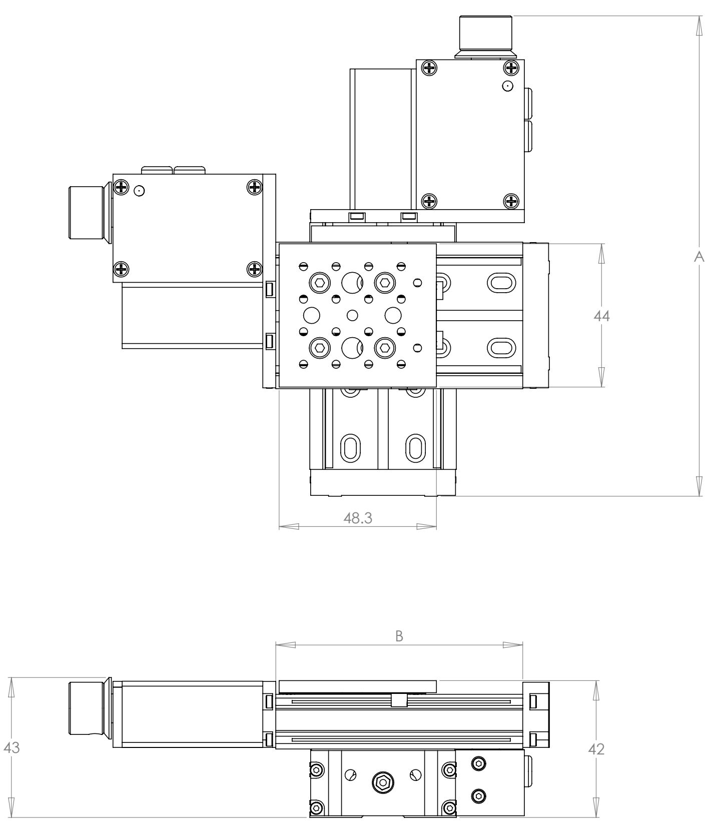
A-LSQ-E Closed-Loop Linear Stages:

- 75 to 600 mm travel †
- 20 kg maximum payload
- Up to 1 m/s speed and 100 N maximum thrust (vertical axis payload)

A-LST High-Load Linear Stages:

- 254, 500, 750, 1000, and 1500 mm travel †
- 100 kg maximum payload (may require linear guide to support cantilever load)
- Up to 420 mm/s and up to 560 N thrust

* Additional specs available at www.zaber.com
† Longer-travel stages may require a linear guide to support cantilever load



Model Number	A	B
T-XY-LSM025	147.5	75.8
T-XY-LSM050	172.9	101.2
T-XY-LSM100	223.7	152.0
T-XY-LSM150	274.5	202.8
T-XY-LSM200	325.3	253.6

* Subtract 13.5 mm knob length from 'A' for -S versions without manual control



- **From 13 mm up to 450 mm travel per axis**
- **Integrated motors and controllers**
- **Daisy-chain and control multiple devices through a single serial port**

Zaber offers motorized stages that can be assembled into many different configurations of XY, XYZ, and XYZ/rotation. You can select your own combination of product family, travel, and lead-screw pitch in each axis to build the system you need. We ship multiple stages un-assembled to avoid damage to the moving parts. Our families of linear stages are listed on the next page. Please refer to the individual product family web pages for specifications.

Installation

One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like “move absolute”), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob permits smooth manual control at variable speeds in both directions. During a manual move the stage’s position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the stage even without a computer.

Multi-Axis Systems: XYZ Series *

Zaber's XYZ systems are made up of three linear stages. They come packaged with all the accessories you will need to operate them in XYZ configuration. The stages in the XYZ series are powered by a standard power supply and connect to the RS-232 port of any computer. Following are some of the types of stages used in our XYZ systems – you can choose the combination of product family, travel, and lead-screw pitch to meet your needs.

T-LSM Miniature Linear Stages:
(shown in drawing)

- 25 to 200 mm travel †
- 10 kg maximum payload
- 25 N maximum thrust (vertical axis payload)

T-LSR Linear Slides:

- 75 to 450 mm travel †
- 20 kg maximum payload
- Up to 80 mm/s speed and up to 100 N thrust

T-LS Linear Stages:

- 13 and 28 mm travel
- 10 kg maximum payload
- 15 N maximum thrust (vertical axis payload)
- Requires AB90 angle bracket for Z-axis (vertical) mounting

A-LSQ Linear Stages:

- 75 to 600 mm travel †
- 20 kg maximum payload
- Up to 1 m/s speed and 100 N maximum thrust (vertical axis payload)

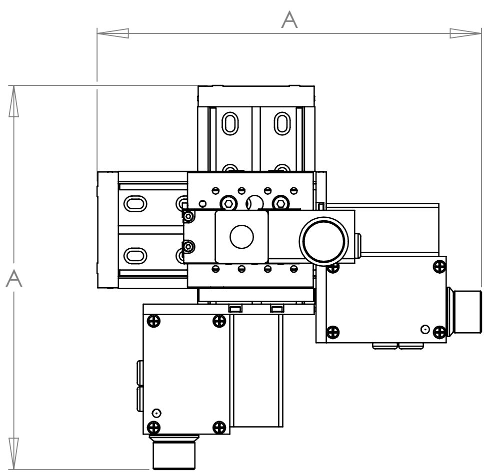
A-LSQ-E Closed-Loop Linear Stages:

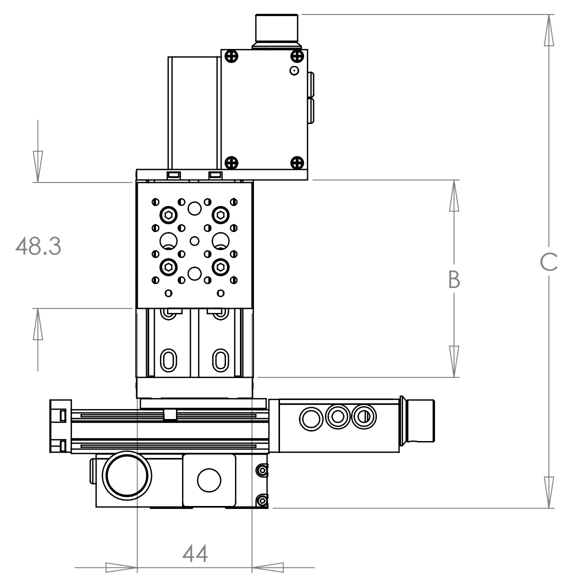
- 75 to 600 mm travel †
- 20 kg maximum payload
- Up to 1 m/s speed and 100 N maximum thrust (vertical axis payload)

A-LST High-Load Linear Stages:

- 254, 500, 750, 1000, and 1500 mm travel †
- 100 kg maximum payload (may require linear guide to support cantilever load)
- Up to 420 mm/s and up to 560 N thrust

* Additional specs available at www.zaber.com
† Longer-travel stages may require a linear guide to support cantilever load





Model Number	A	B	C
T-XYZ-LSM025	147.5	75.8	189.5
T-XYZ-LSM050	172.9	101.2	214.9
T-XYZ-LSM100	223.7	152.0	265.7
T-XYZ-LSM150	274.5	202.8	316.5
T-XYZ-LSM200	325.3	253.6	367.3

* Subtract 13.5 mm knob length from 'A' and 'C' for -S versions without manual control



- **100 or 200 mm travel per axis (custom lengths available)**
- **Low profile: 70 mm overall height (custom heights available)**
- **Up to 12 μm accuracy**
- **Customizable: add another Zaber stage for a Z-axis**

Zaber's T-G-LSM gantries are designed for multi-axis applications where high loads require the additional support of parallel lower axis stages or where access is required to the entire area under the system. A synchronized lead-screw design provides very low backlash and high stiffness for precision positioning. T-G-LSM gantry systems include a baseplate with M6 mounting holes on a 25 mm grid and an integrated cable management system. They ship fully assembled and ready to operate.

Installation

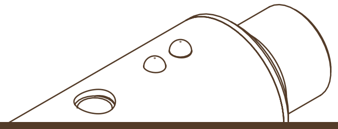
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob for each axis permits smooth manual control at variable speeds in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the system even without a computer.



Gantry Systems *

Zaber's standard gantry systems, such as the T-G-LSM (see dimension drawing below), are made up of three linear stages and provide two-axis (XY) motion. A fourth stage can be added for a Z-axis. These systems come packaged with all the accessories you will need for operation. The stages in our gantry systems are powered by a standard power supply and connect to the RS-232 port of any computer. We can also make customized gantries with the following linear stages – you can choose the combination of product family, travel, and lead-screw pitch to meet your needs. Exact final gantry system specifications will vary depending on your selections.

T-LSM Miniature Linear Stages:

- 100 to 200 mm travel
- 10 kg maximum payload
- 25 N maximum thrust
- Our most compact motorized stages with built-in controllers

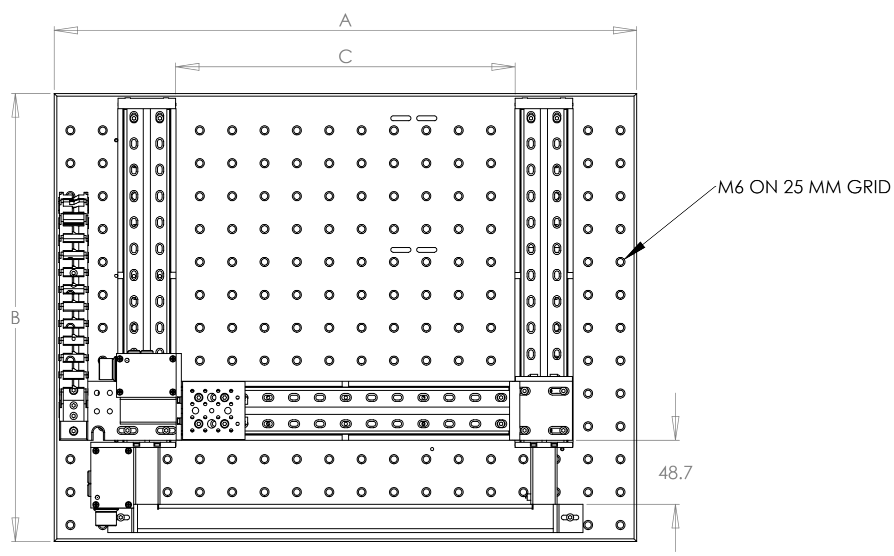
A-LSQ Linear Stages:

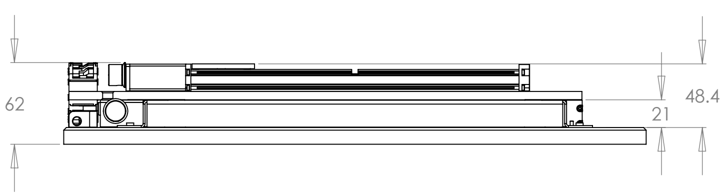
- 75, 150, 300, 450, and 600 mm travel
- 20 kg maximum payload
- Up to 1 m/s speed and up to 100 N thrust

A-LST High-Load Linear Stages:

- 254, 500, 750, 1000, and 1500 mm travel
- 100 kg maximum payload
- Up to 420 mm/s and up to 560 N thrust

* Additional specs available at www.zaber.com





Model Number	A	B	C
T-G-LSM100A100A	350	250	160.2
T-G-LSM100A200A	450	250	261.8
T-G-LSM200A100A	350	340.5	160.2
T-G-LSM200A200A	450	340.5	261.8



- **150, 300, or 450 mm travel per axis (custom lengths available)**
- **Up to 330 mm/s speed or 100 N thrust depending on lead-screw choice**
- **High load capacity: up to 180 N centred load and 800 N·cm cantilever load**
- **Customizable: add another Zaber stage for a Z-axis**

Zaber's G-LSQ gantries are designed for multi-axis applications where high loads require the additional support of parallel lower axis stages or where access is required to the entire area under the system. A synchronized lead-screw design provides low backlash and high stiffness for precision positioning. G-LSQ gantry systems include a baseplate with M6 mounting holes on a 25 mm grid and an integrated cable management system. They ship fully assembled and ready to operate.

Installation

One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Convenient 6-pin mini-DIN cables on the stage allow for direct interconnection between devices in close proximity. For longer distances, we offer standard cable extensions.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the stage reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

A convenient knob for each axis permits smooth manual control at variable speed in both directions. During a manual move the stage's position is constantly transmitted to the computer and is displayed by the software. The knob allows you to use the system even without a computer.

Gantry Systems *

Zaber's standard gantry systems, such as the G-LSQ (see dimension drawing below), are made up of three linear stages and provide two-axis (XY) motion. A fourth stage can be added for a Z-axis. These systems come packaged with all the accessories you will need for operation. The stages in our gantry systems are powered by a standard power supply and connect to the RS-232 port of any computer. We can also make customized gantries with the following linear stages – you can choose the combination of product family, travel, and lead-screw pitch to meet your needs. Exact final gantry system specifications will vary depending on your selections.

A-LSQ Linear Stages:

- 75, 150, 300, 450, and 600 mm travel
- 20 kg maximum payload
- Up to 1 m/s speed and up to 100 N thrust

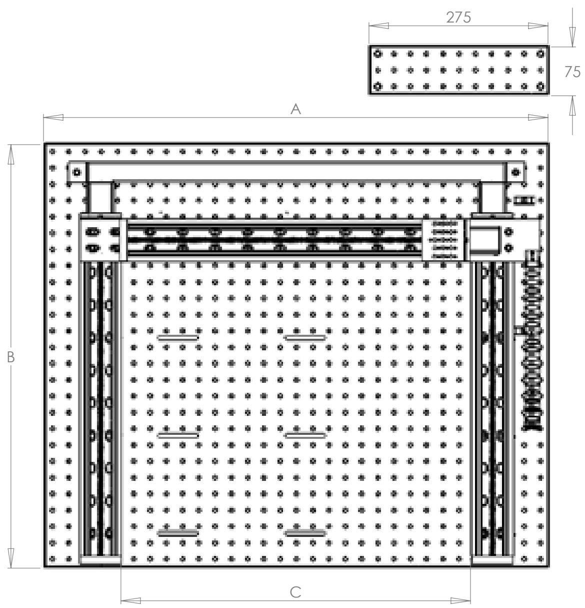
T-LSM Miniature Linear Stages:

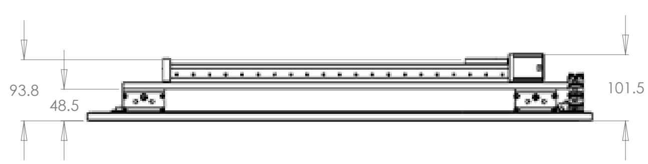
- 100 to 200 mm travel
- 10 kg maximum payload
- 25 N maximum thrust
- Our most compact motorized stages with built-in controllers

A-LST High-Load Linear Stages:

- 254, 500, 750, 1000, and 1500 mm travel
- 100 kg maximum payload
- Up to 420 mm/s and up to 560 N thrust

* Additional specs available at www.zaber.com





Model Number	A	B	C
G-LSQ150A150A	450	350	223
G-LSQ300A300A	650	500	418
G-LSQ450A450A	775	650	537

Thank you for all your help so far; it has been very satisfying. Your helpfulness and good service is one of the reasons we chose Zaber as an XY-table supplier for our project.

– Alexander E. Hansen, Student at the Faculty of Technology, Sor-Trondelag University College

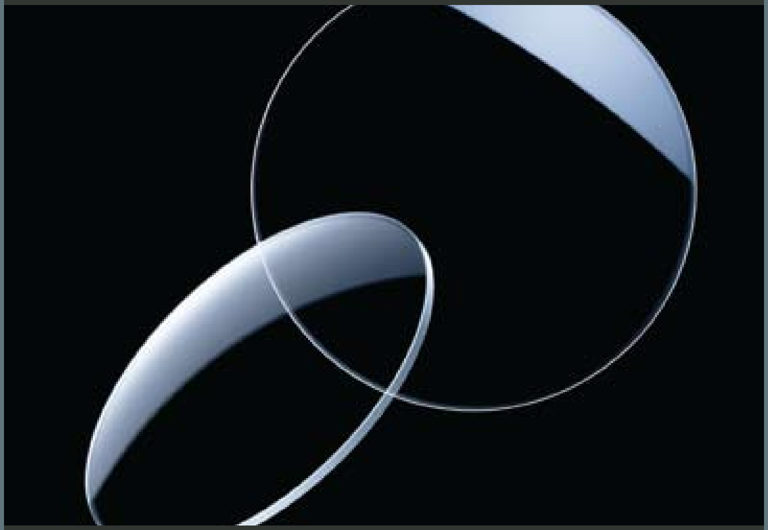
T-LSR Linear Slide

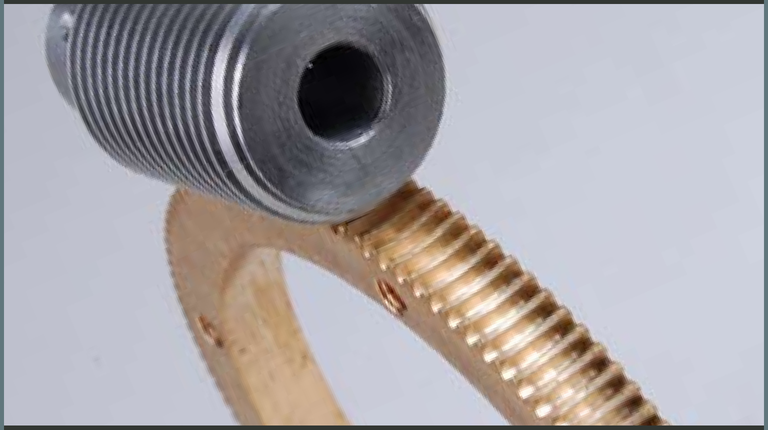
A lot of people were requesting linear slides with longer travel and higher speed than what we had. In particular, I remember one customer who wanted to position a 20 kg camera to within 0.1 µm resolution, and another who wanted to shake a mobile phone at 10 Hz to see how long it would take to fail. There was a real demand to move things faster, and to move things much heavier than a sensor or a petri dish. Many people also wanted to mount their slides in XY or XYZ configurations. These needs formed the basis for the design of our T-LSR series slides.

There were some frustrating moments during lifetime testing of the alpha prototype. Some of the initial component choices were inadequate, but after revising the design a few times we finally reached a point where we were really happy with it. Apparently, so are our customers! The T-LSR turned out to be more of a success than any of us expected.

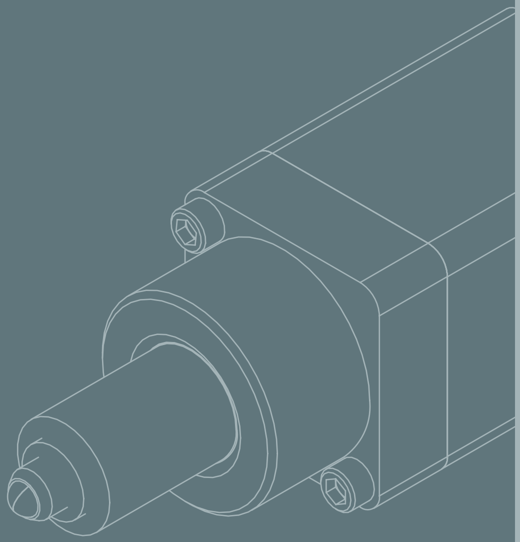
– Jesse Schuhlein, Senior Product Manager, Zaber Technologies







Tilt





- **Two-axis gimbal optic mount with built-in controller**
- **Holds 1˝ (25 mm) optics**
- **+/- 7° travel in each axis**
- **Compact design weighs only 350 g (0.75 lb)**

The T-OMG is a high resolution, computer-controlled, two-axis optic mount. It is a stand-alone unit requiring only a 15 V power supply. Two built-in controllers allow for easy, independent manipulation of each axis of rotation.

Installation

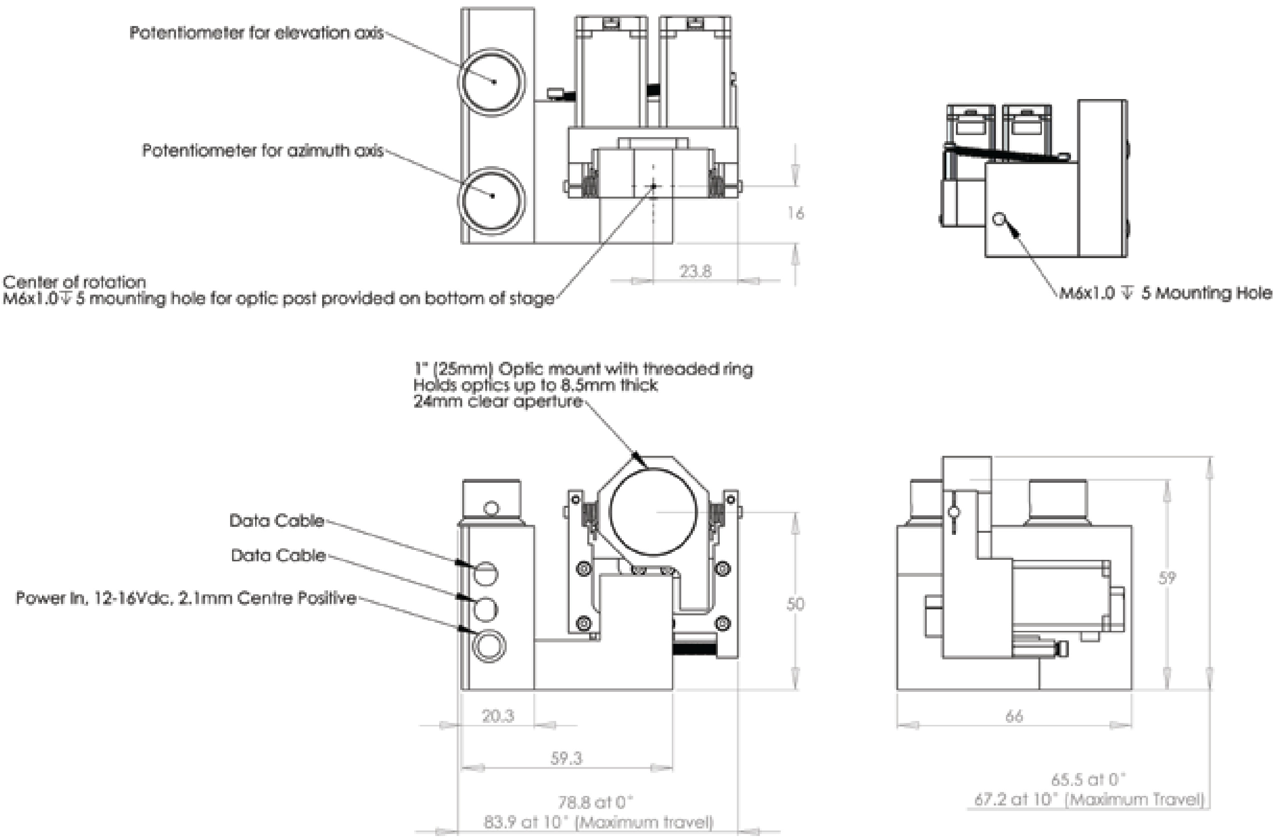
One or more gimbal optic mounts can be connected to the RS-232 port (or a USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the gimbal optic mount reports the new position of each axis. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Convenient knobs on the top of the optic mount permit smooth manual control of each axis. Turn one of the knobs a little and the actuator for the corresponding axis will move slowly, or turn the knob fully for quick, coarse positioning. During a manual move, the optic mount's position is constantly transmitted to the controlling computer and is displayed by the software. You can also use the T-OMG optic mount without a computer, simply using the manual knobs for all adjustments.



Motorized Gimbal Optic Mounts: T-OMG *

Model	Axis	Travel Range (°)	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Maximum Speed (°/s)	Weight (kg)
T-OMG	Axis 1 (Azimuth)	+/- 7	0.00012	+/- 0.030	< 0.007	11	0.35
	Axis 2 (Elevation)	+/- 7	0.00006	+/- 0.015	< 0.004	7	

* Additional specs available at www.zaber.com

We just used [a Zaber] actuator during a CAT scan to compress 25.4 mm diameter polyurethane tubing at 1 mm increments up to 10 mm and study the compression. It works perfectly! Thank you so much for all your help [with setting up the scripts in the Zaber Console].

– Michael Navitsky, Penn State University



- **Two-axis mirror mount (+/- 5.27° tilt) with built-in controller**
- **Holds 2˝ (50 mm) optics**
- **Optional adaptors: C-mount, 1˝ (25 mm), and 1/2˝ (12.5 mm) optics**

The T-MM is a computer-controlled, two-axis mirror mount with 1.5 μrad (0.000086°) resolution. It is a stand-alone unit requiring only a 15 V power supply. It has a built-in controller for each axis, so that you can easily control each axis independently.

Installation

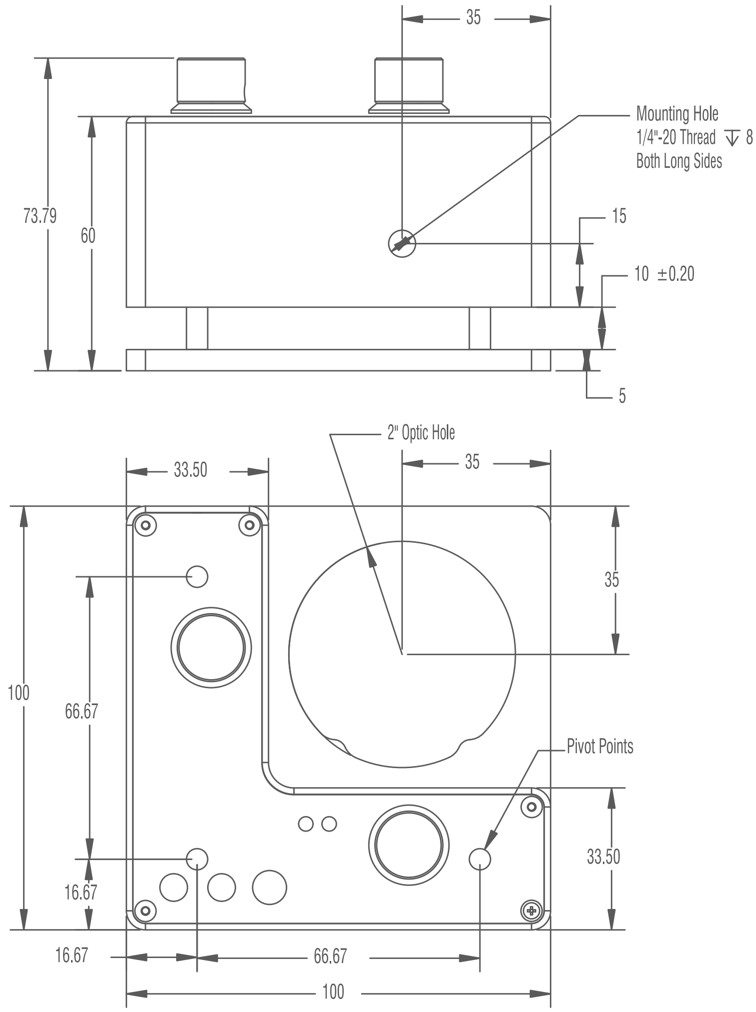
One or more mirror mounts can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the mirror mount reports the new position of each axis. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.

Manual Control

Convenient knobs on the back of the mirror mount permit smooth manual control of each axis. Turn one of the knobs a little and the actuator for the corresponding axis moves at its minimum speed, or turn the knob fully for maximum speed. During a manual move the mirror mount's position is constantly transmitted to the controlling computer and is displayed by the software. You can use the mirror mount without a computer as well, simply using the manual knobs for all adjustments.



Motorized Mirror Mounts: T-MM *						
Model	**Travel Range (°)**	**Microstep Size (Resolution) (°)**	**Accuracy (°)**	**Repeatability (°)**	**Maximum Speed (°/s)**	**Weight (kg)**
T-MM2	+/- 5.27	0.000086	+/- 0.01	< 0.0005	3.44	0.55

* Additional specs available at www.zaber.com

I must say that zaber.com has the best information I've ever seen from a company selling research equipment. It's really nice that you supply all the source code and clear specification of how to communicate with the devices.

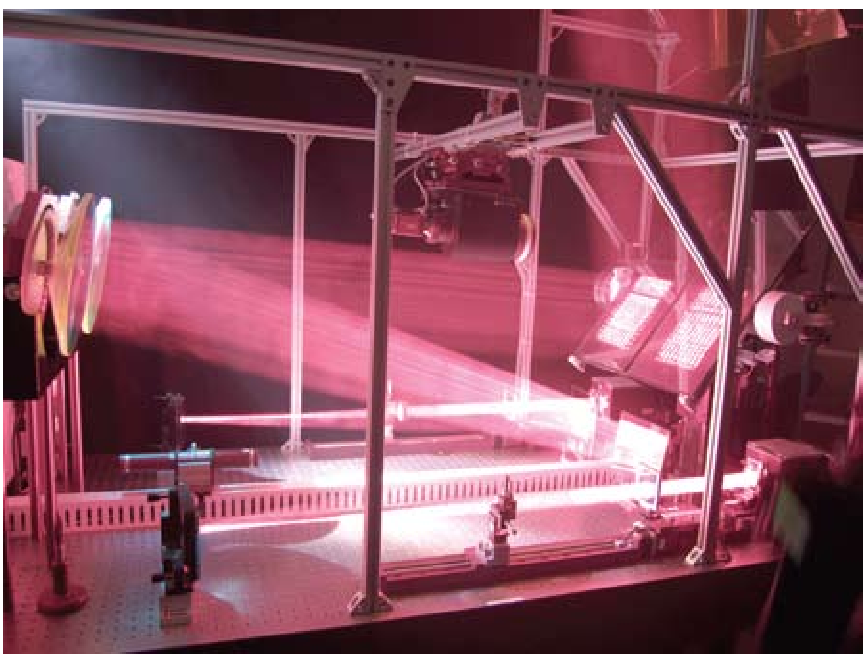
– Hjalmar Turesson, Post-Doctoral Student, Rutgers State University, Newark Campus

LaserMotive, LLC

www.lasermotive.com

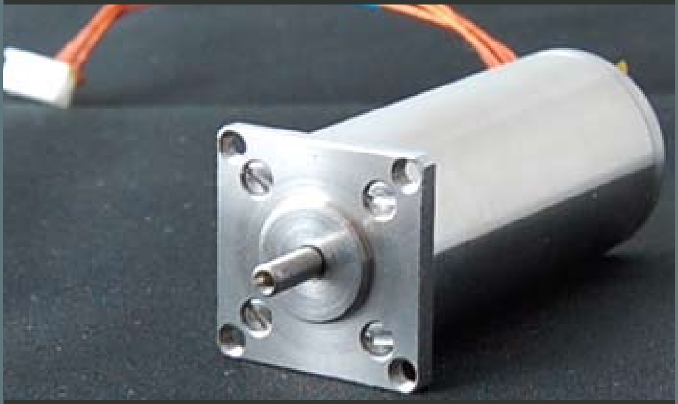
LaserMotive creates systems to deliver electric power without wires by directing laser light to a specialized solar cell that turns the light into electricity. Laser power beaming can transmit power to electric aircraft or remote terrestrial locations, launch rockets without on-board power, or beam solar energy between space and Earth.

In 2005, NASA offered a challenge to any group that could demonstrate long-range, high-energy power beaming. Using the Space Elevator Games as the framework for its competition, it required teams to create a laser-powered robot able to lift a weight vertically 1 km at speed. Until November 2009, no one had successfully met the challenge. In NASA's November 2009 Power Beaming Challenge, LaserMotive not only became the first and only team to succeed – after four years of effort by more than 20 other teams – but it nearly doubled NASA's requirements for the Level 1 prize, winning $900,000 in the process.

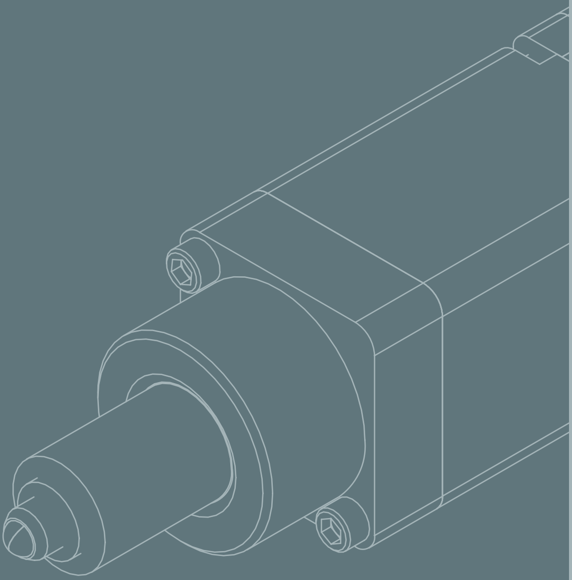


As we prepare to enter the next round of the NASA Power Beaming Challenge, we are using a pair of Zaber's T-LSR450D linear slides to drive the focus element in our laser transmitter. The high speed and accuracy of the T-LSR450D enable us to meet the Challenge requirements for keeping our laser beam focused on the rapidly moving receiver.

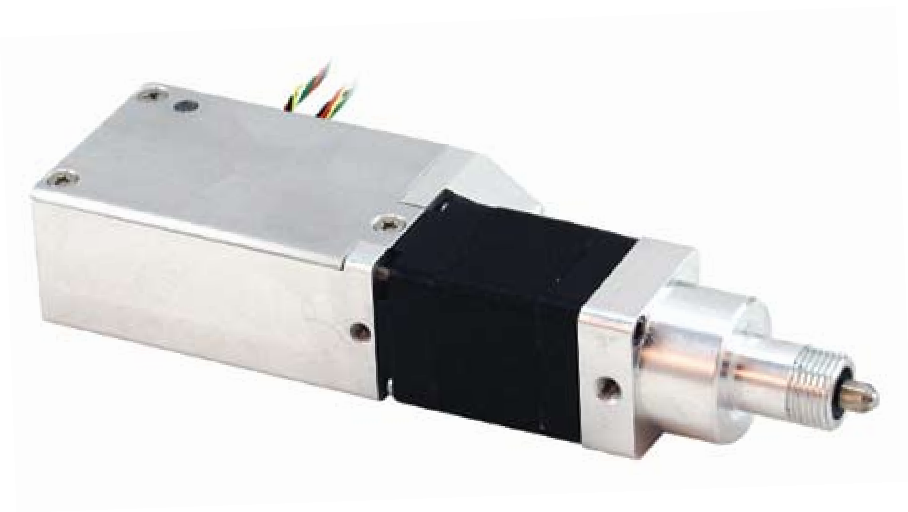
– Tom Nugent, President, LaserMotive, LLC



Vacuum







- **Integrated motor and controller in a tiny package**
- **Low and high vacuum compatible versions available**
- **Daisy-chains with other T-Series products inside vacuum chamber**
- **Only five feedthrough wires required to run up to four devices**

Zaber's T-NA-SV series miniature linear actuators are computer controlled, have 0.05 μm resolution, and offer either 25 mm or 50 mm travel. The low vacuum versions (-SV1) are designed for use down to pressures of 10^{-3} Torr, and the high vacuum versions (-SV2) are designed for use down to pressures of 10^{-6} Torr. Each actuator comes with a hardened ball tip that you can remove if you prefer to use the built-in threaded tip or a flat tip. They are stand-alone units requiring only a standard 15 V power supply.

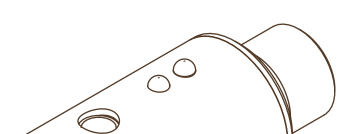
Components are chosen for low outgassing, and vacuum compatible greases and motors are used in both low and high vacuum devices. High vacuum parts are cleaned ultrasonically or by hand with isopropyl alcohol and assembled in a Class 100 cleanroom. High vacuum circuit boards are Parylene coated for vacuum compatibility, and all blind holes in the devices are vented. High vacuum devices are double-bagged in Ultra Low Outgassing (ULO®) polyethylene bags.

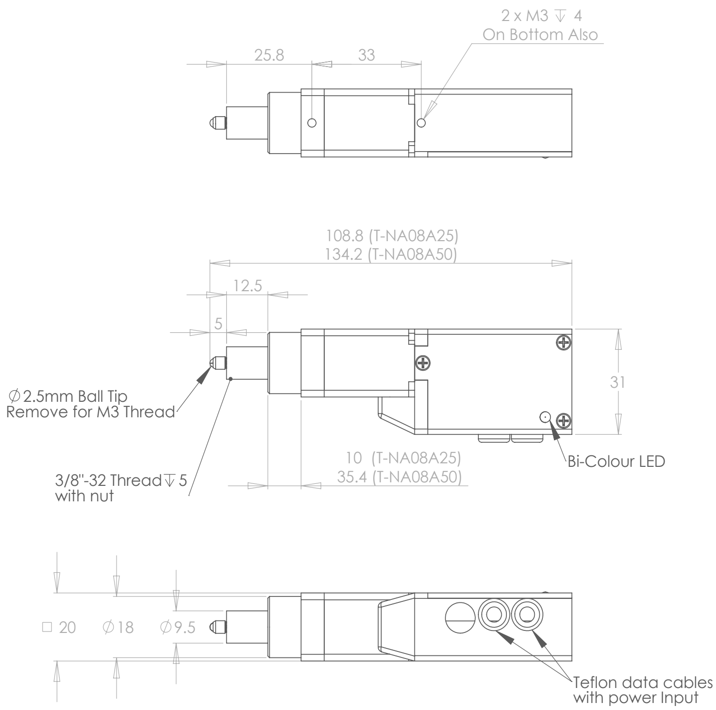
Installation

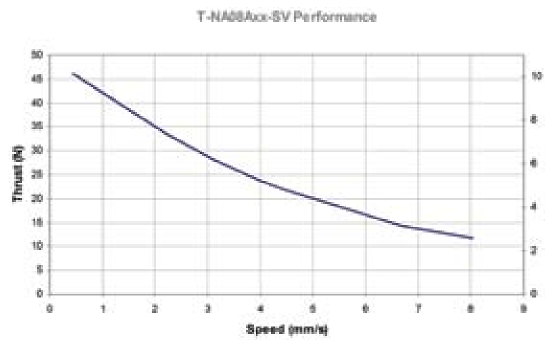
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Up to four devices can be controlled in a vacuum chamber using only five feedthrough wires. An industry standard 3/8″ (9.5 mm) diameter micrometer shank allows the T-NA to fit many popular stages. The plunger of the T-NA actuator does not rotate.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the actuator reports its new position. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.





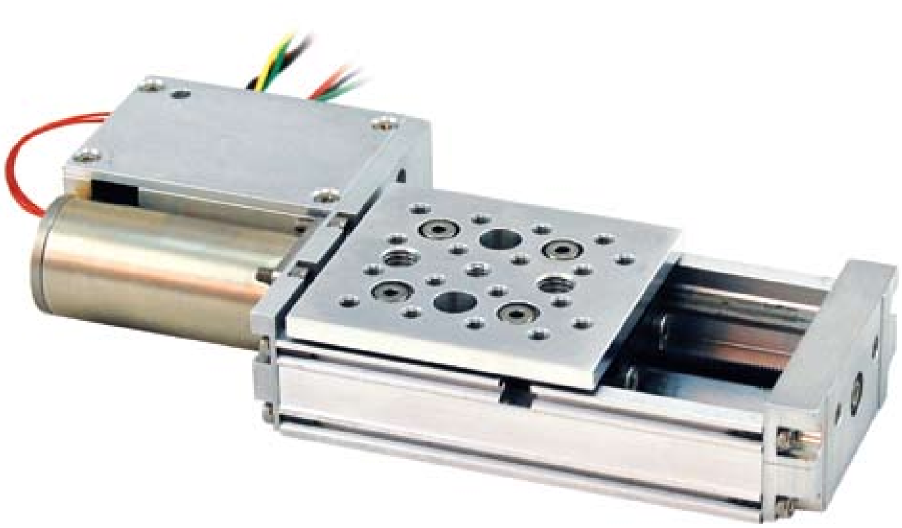


Vacuum Compatible Miniature Linear Actuators: T-NA-SV *									
Model	**Travel Range (mm)**	**Vacuum Rating (Torr)**	**Microstep Size (Resolution) (µm)**	**Accuracy (µm)**	**Repeatability (µm)**	**Backlash (µm)**	**Minimum Speed (µm/s)**	**Maximum Speed (mm/s)**	**Weight (kg)**
T-NA08A25-SV1	25.4	10^{-3}	0.048	+/- 8	< 1	< 4	0.22	8	0.13
T-NA08A25-SV2	25.4	10^{-6}	0.048	+/- 8	< 1	< 4	0.22	8	0.13
T-NA08A50-SV1	50.8	10^{-3}	0.048	+/- 8	< 1	< 4	0.22	8	0.15
T-NA08A50-SV2	50.8	10^{-6}	0.048	+/- 8	< 1	< 4	0.22	8	0.15

* Additional specs available at www.zaber.com

We use Zaber actuators because they are so easy to daisy-chain in a vacuum, and we can think about the experiments we want to do without having to worry about complex wiring or programming. They save us time and money. I would happily recommend them.

– Dr. Fergal O'Reilly, Research Physics and Innovation Officer, Physics Department, University College Dublin



- **Integrated motor and controller**
- **Low and high vacuum compatible versions available**
- **Daisy-chains with other T-Series devices inside vacuum chamber**
- **Only five feedthrough wires required to run up to four devices**

Zaber's T-LSM-SV series devices are computer-controlled, vacuum compatible, motorized linear stages in a very compact size. The low vacuum versions (-SV1) are designed for use down to pressures of 10^{-3} Torr, and the high vacuum versions (-SV2) are designed for use down to pressures of 10^{-6} Torr. They are stand-alone units requiring only a standard 15 V power supply.

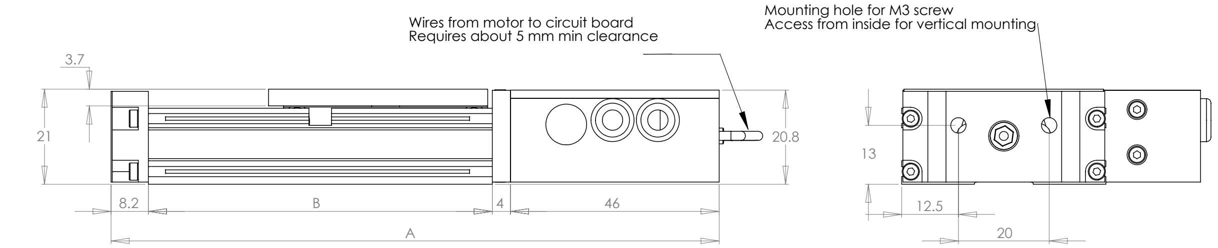
Components are chosen for low outgassing, and vacuum compatible greases and motors are used in both low and high vacuum devices. High vacuum parts are cleaned ultrasonically or by hand with isopropyl alcohol and assembled in a Class 100 cleanroom. High vacuum circuit boards are Parylene coated for vacuum compatibility, and all blind holes in the devices are vented. High vacuum devices are double-bagged in Ultra Low Outgassing (ULO®) polyethylene bags.

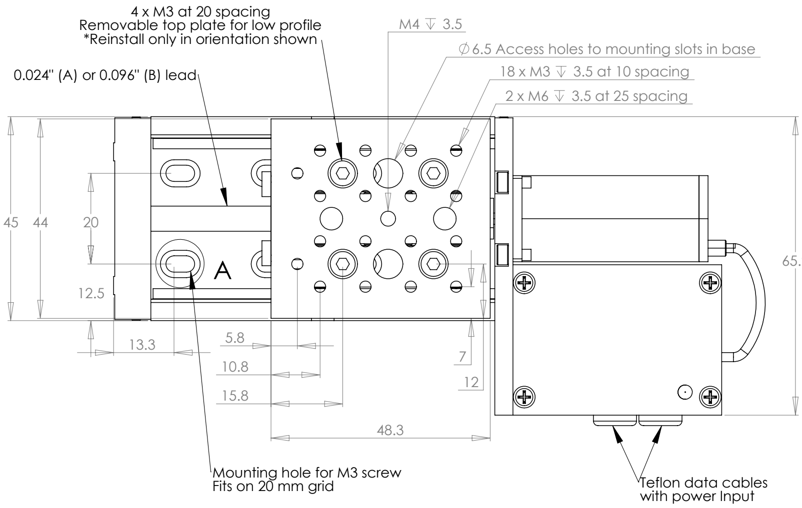
Installation

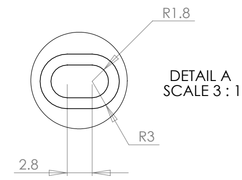
One or more devices can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port. Up to four devices can be controlled in a vacuum chamber using only five feedthrough wires. These stages are ready for assembly in XY or XYZ configuration with no additional hardware required. See Multi-Axis section for more information.

Computer Control

We provide free software so you can easily control your Zaber devices. Zaber's intuitive Windows software makes it easy to control the speed and position of the unit and change the device settings. After completing a move command, the stage will report its position through the RS-232 link. Built-in scripting allows you to easily set up complex automation routines. For LabVIEW users, we offer a free, certified LabVIEW driver. For a detailed list of available commands see the user's manual.

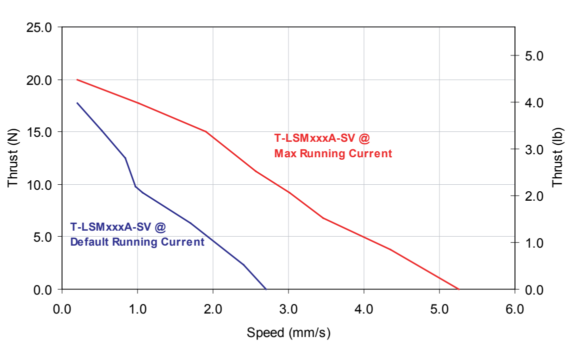




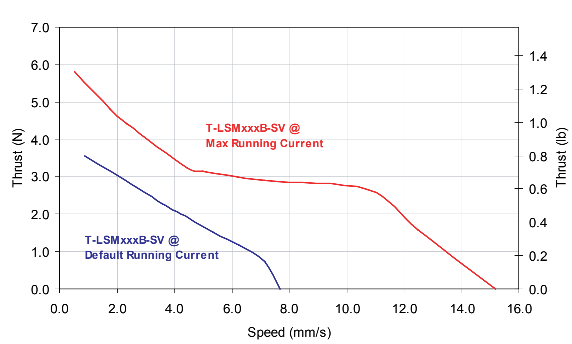


Model Number	A	B
T-LSM025	134	75.8
T-LSM050	159.4	101.2
T-LSM100	210.2	152.0
T-LSM150	261	202.8
T-LSM200	311.8	253.6

T-LSMxxxA-SV Performance



T-LSMxxxB-SV Performance



Note: See accuracy chart on p. 21

Vacuum Compatible Motorized Linear Stages: T-LSM-SV *

Model †	Travel Range (mm)	Microstep Size (Resolution) (μm)	Accuracy (μm)	Repeatability (μm)	Backlash (μm)	Maximum Speed (mm/s)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Maximum Continuous Thrust (N)	Weight (kg)
T-LSM025A-SV2	25.4	0.048	+/- 4	< 1	< 3	4	100	300	16	0.31
T-LSM025B-SV2	25.4	0.19	+/- 9	< 4	< 13	15	100	300	6	0.31
T-LSM050A-SV2	50.8	0.048	+/- 8	< 1	< 3	4	100	300	16	0.32
T-LSM050B-SV2	50.8	0.19	+/- 13	<4	< 13	15	100	300	6	0.32
T-LSM100A-SV2	101.6	0.048	+/- 16	< 1	< 3	4	100	300	16	0.35
T-LSM100B-SV2	101.6	0.19	+/- 21	< 4	< 13	15	100	300	6	0.35
T-LSM150A-SV2	152.4	0.048	+/- 24	< 1	< 3	4	100	300	16	0.40
T-LSM150B-SV2	152.4	0.19	+/- 29	< 4	< 13	15	100	300	6	0.40
T-LSM200A-SV2	203.2	0.048	+/- 32	< 1	< 3	4	100	300	16	0.42
T-LSM200B-SV2	203.2	0.19	+/- 37	< 4	< 13	15	100	300	6	0.42

* Additional specs available at www.zaber.com

† Specs listed above apply to low vacuum (-SV1) stages, rated for 10^{-3} Torr, and high vacuum (-SV2) stages, rated for 10^{-6} Torr





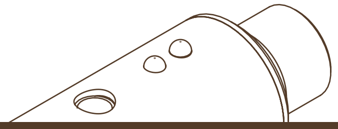
- **Compatible with Zaber's T-NA-SV1 actuators (shown upper right)**
- **Reversible mounting bracket allows left-hand or right-hand operation**
- **Brackets have a convenient clamping mechanism for easy adjustments**

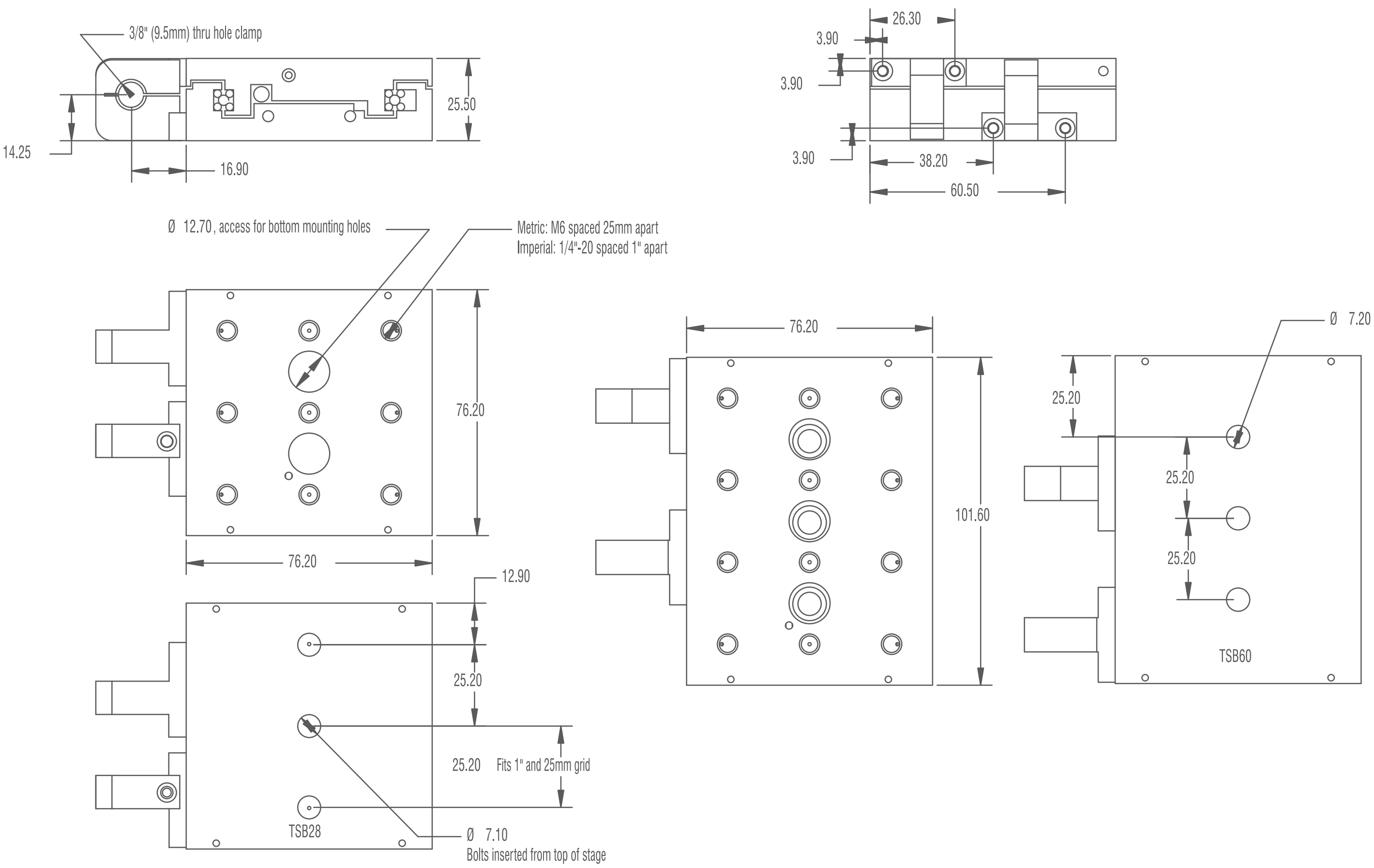
Zaber's low vacuum TSB-V ball bearing translation stages are available in two sizes, offering either 28 mm or 60 mm of travel. TSB-V stages ensure smooth and accurate motion: they are made from precision-machined aluminum, with precision-ground rails and ball bearings. Choose from either metric M6 mounting holes on 25 mm spacing, or imperial 1/4″-20 mounting holes on 1″ spacing.

These stages use vacuum compatible greases and non-anodized components. They are designed for use down to pressures of 10^{-3} Torr.

Installation

Each stage includes a pair of actuator mounting brackets that include a convenient clamping mechanism to grip actuators, and are easily adjusted or locked in place. The mounting brackets are compatible with Zaber actuators: the standard 9.5 mm brackets fit our T-NA-SV1 series of actuators. TSB-V stages can be mounted directly in XY configuration. Optional AB90-V angle brackets are available for mounting in XYZ configuration.





Low Vacuum Translation Stages: TSB-V *

Model	Travel Range (mm)	Maximum Centred Load (N)	Maximum Cantilever Load (N·cm)	Stage Parallelism (μm)	Vacuum Rating (Torr)	Mounting Thread
TSB28E-V	28	100	125	< 100	10^{-3}	1/4″-20
TSB28M-V	28	100	125	< 100	10^{-3}	M6
TSB60E-V	60	100	125	< 100	10^{-3}	1/4″-20
TSB60M-V	60	100	125	< 100	10^{-3}	M6

* Additional specs available at www.zaber.com



- Rated for 10^{-3} Torr
- Two-axis mirror mount (+/- 5.27° tilt) with built-in controller
- Holds 2˝ (50 mm) optics
- Optional adaptors: C-mount, 1˝ (25 mm), and 1/2˝ (12.5 mm) optics

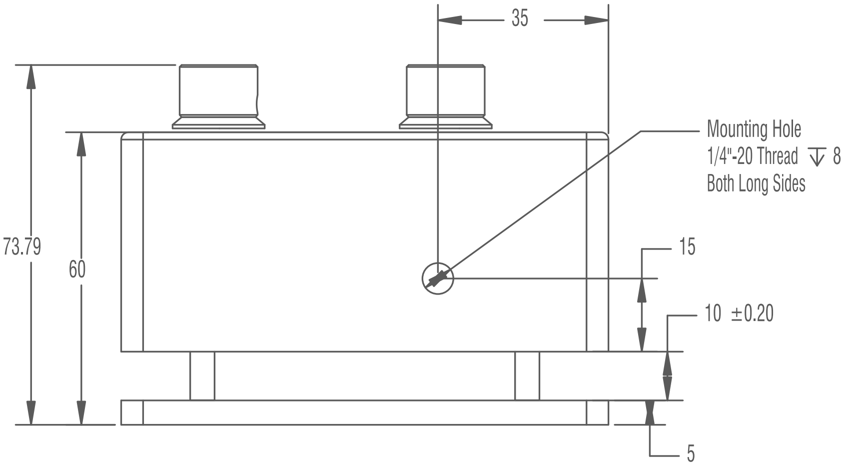
The T-MM-V is a vacuum compatible, computer-controlled, two-axis mirror mount with 1.5 μrad (0.000086°) resolution. It is a stand-alone unit requiring only a 15 V power supply. It has a built-in controller for each axis, so that you can easily control each axis independently.

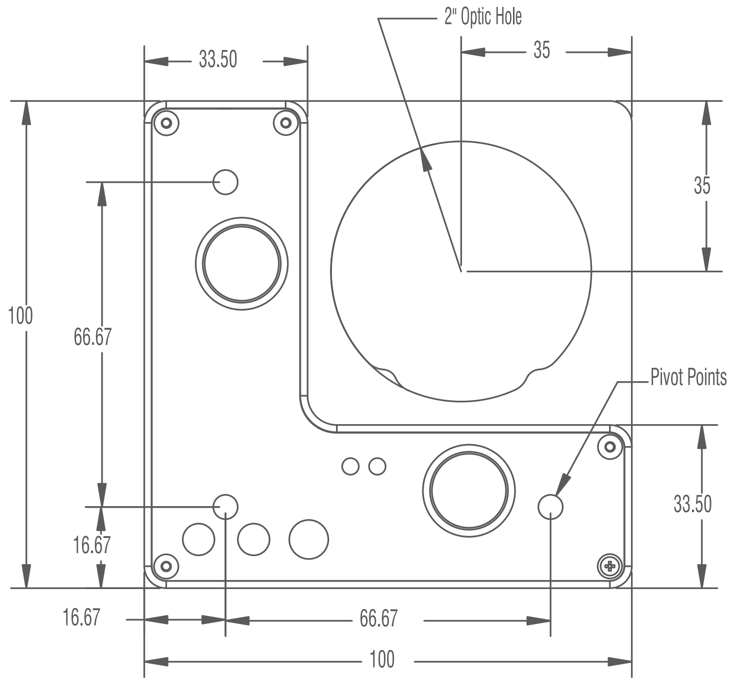
Installation

One or more mirror mounts can be connected to the RS-232 port (or USB port with optional adaptor) of any computer. Multiple devices can be daisy-chained to a single port.

Computer Control

We provide free software so you can easily control your Zaber devices. Simply select the device you want to move, select a command (like “move absolute”), and enter the desired position. After the move, the mirror mount reports the new position of each axis. Built-in scripting allows you to easily set up complex automation routines. We also provide all of our source code so that you can customize our software for your application.





Vacuum Compatible Motorized Mirror Mounts: T-MM-V *							
Model	Travel Range (°)	Microstep Size (Resolution) (°)	Accuracy (°)	Repeatability (°)	Maximum Speed (°/s)	Vacuum Rating (Torr)	Weight (kg)
T-MM2-V1	+/- 5.27	0.000086	+/- 0.01	< 0.0005	3.44	10^{-3}	0.55

* Additional specs available at www.zaber.com

T-JOY3 Joystick

At Zaber we often develop products in direct response to customer requests. Our programmable joystick, the T-JOY3, is a classic example. We had been getting a lot of requests for a joystick that could be used for manual control of our products mounted in XY, XYZ, or XY/rotation configurations. Many customers wanted to position something under a microscope or camera: X and Y would adjust the position and Z would adjust the focus or magnification.

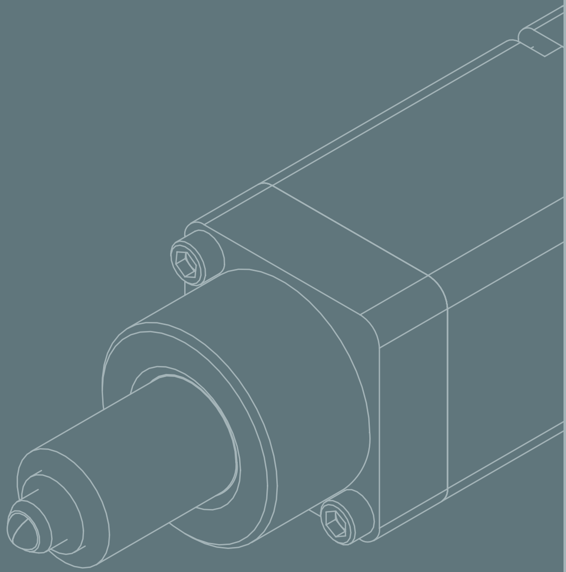
We had a lot of success in the concept stage so we were able to design, test, and launch the T-JOY3 in a matter of months. I was happy to see the project completed so quickly. I was even happier to see orders start coming in, followed by positive feedback from customers.

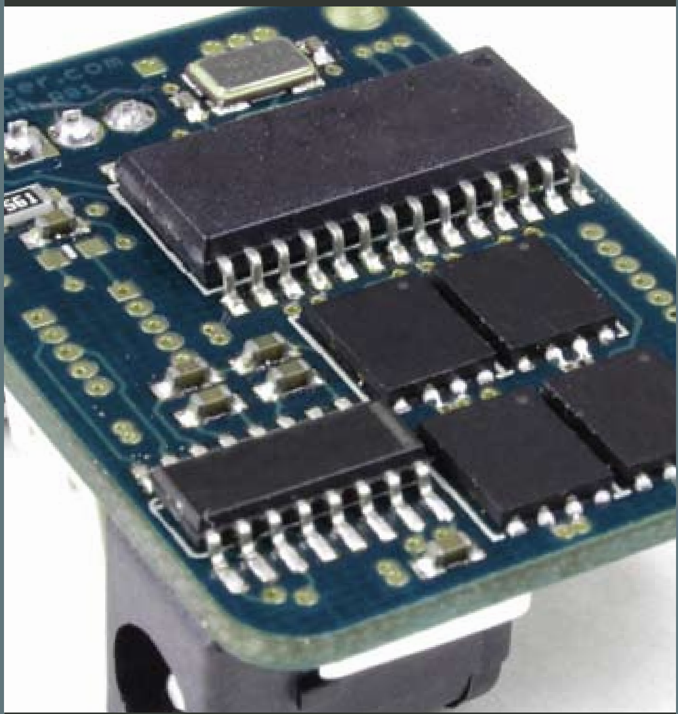
– Andrew Lau, Product Manager, Zaber Technologies





Controllers







- **Controls any bipolar stepper motor or actuator up to 2.5 A/phase**
- **Manual control knob: move the device at variable speeds and distances**
- **Mounts easily to panel, lab bench, or electronics cabinet**
- **Contains presets for Zaber actuators and stages**

Zaber's T-MCA stepper motor controller is a microstep driver offering microstepping down to 128 microsteps per step. With a typical stepper motor having 200 steps per revolution, the T-MCA stepper motor controller allows microstepping down to 25,600 microsteps per revolution. The T-MCA stepper controller can be used to control any two-phase stepper motor with continuous current draw up to 2.5 A per phase.

Zaber's A-MCA stepper motor controller has similar functionality to the T-MCA with the additional capability of handling encoder feedback and communicating in ASCII, making it compatible with hundreds of third-party terminal programs and suitable for more rigorous industrial applications.

Installation

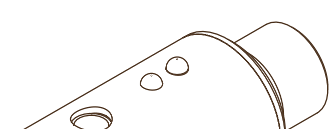
Set-up is a snap. Just connect the controller to the RS-232 port (or USB port with optional adaptor) and plug in a compatible motor or actuator. Multiple devices can be daisy-chained to a single port. Plug in a motor or actuator and you're ready to go.

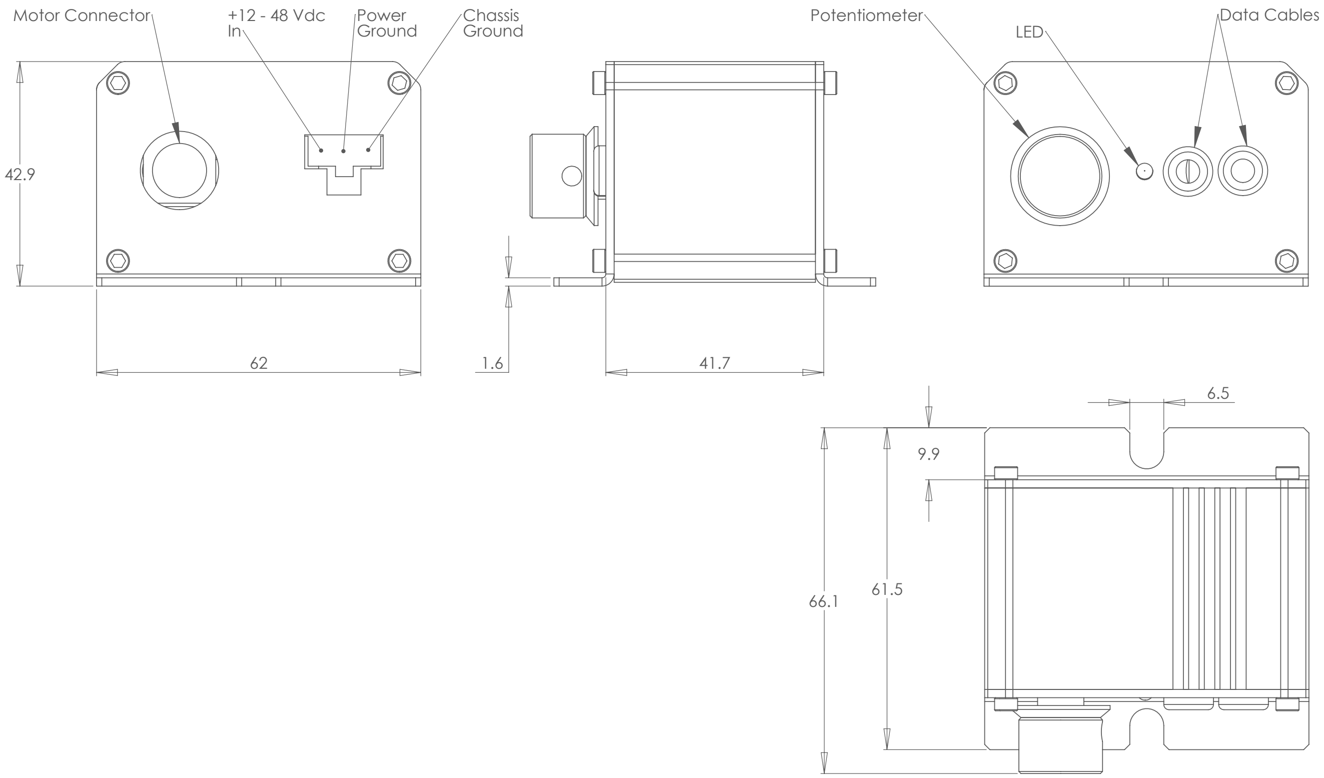
Computer Control

We provide free software so you can easily control your Zaber devices. It automatically recognizes all your devices and allows you to communicate with each one. Simply select the device you want to move, select a command (like "move absolute"), and enter the desired position. After the move, the controller reports the device's new position. You can also change a variety of settings, such as the running current and hold current, to suit your application's needs. Built-in scripting allows you to easily set up automated routines, and programmers can modify the source code for advanced customization.

Manual Control

A convenient knob on the T-MCA permits smooth manual control at variable speeds in both directions. The A-MCA's indexed knob provides convenient manual control via user-selectable modes. In velocity mode, each increment of the knob increases or decreases the speed by a fixed amount. In displacement mode, each increment of the knob moves the device by a user-configurable distance. You can also issue a stop command by depressing the knob during any operation. During manual moves, our controllers constantly transmit motor or actuator position to the computer, so it can be displayed by the software.





See www.zaber.com for A-MCA drawing

Stepper Motor Controllers *								
Model	**Current Output per Phase (mA)**	**Input Voltage (Vdc)**	**Operating Temperature (°C)**	**Communication Protocol**	**Motor Connector**	**Manual Control**	**Encoder Input**	**Weight (kg)**
T-MCA	2500	12–48	0–50	RS-232 binary	Mini-DIN 8	Potentiometer	N/A	0.13
A-MCA	2500	12–48	0–50	RS-232 binary, RS-232 ASCII	D-sub 15	Indexed knob/ push switch	Quadrature	0.15

* Additional specs available at www.zaber.com

I am very impressed with how the Zaber staff have been handling [my RMA]. I would like to single out Eliza, who has been my main point of contact, as being extraordinarily patient and helpful with all my questions and in working with me to get my old units changed out and replaced with better options. Thanks again for all your help and please let me know if there is anything more I can do – or anyone else I can contact – to sing your praises further.

– Gideon Coltof, Bodkin Design and Engineering, LLC

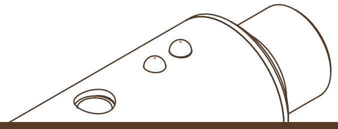


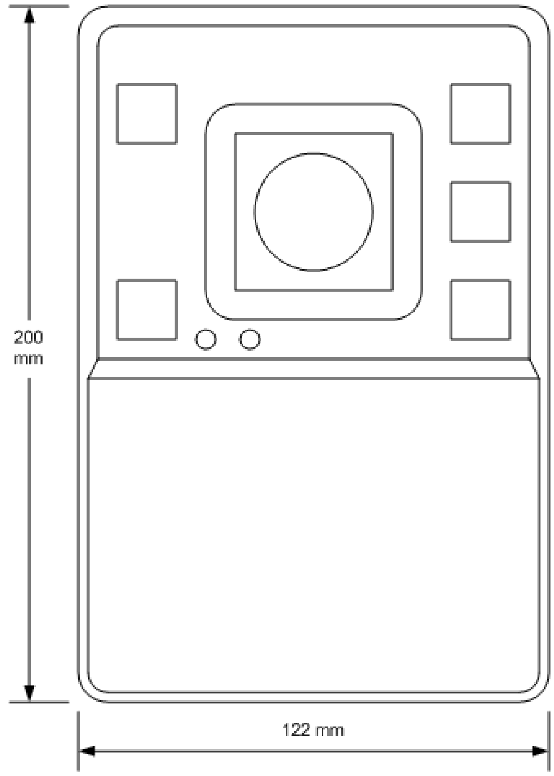
- **Controls up to three axes with programmable sensitivity and velocity profile**
- **Compact bench-top design enables human interface with or without a computer**
- **Five programmable buttons for functions like store and recall positions**

In stand-alone operation, the T-JOY3 is ideal for XY or XYZ applications. The joystick is intuitive to use, and the buttons are preprogrammed with commands to home the devices, save current positions, and go to saved positions. It is ideal for applications where complex computer control is not required.

For more sophisticated applications, you can connect the T-JOY3 to your computer so both the computer and the joystick can simultaneously control connected motion devices through the daisy-chain. The joystick's five buttons are fully programmable: send any command to the devices connected by the daisy-chain, or trigger the computer to execute preprogrammed command sequences. The software continuously displays the status of the joystick and the devices attached to it. The entire daisy-chain can be controlled through a single RS-232 port (or USB port with optional adaptor) on a laptop or desktop.

One axis is controlled by moving the joystick from left to right, another by moving the joystick from front to back, and a third by rotating the handle. By programming the joystick, you can specify which connected device corresponds to each axis.



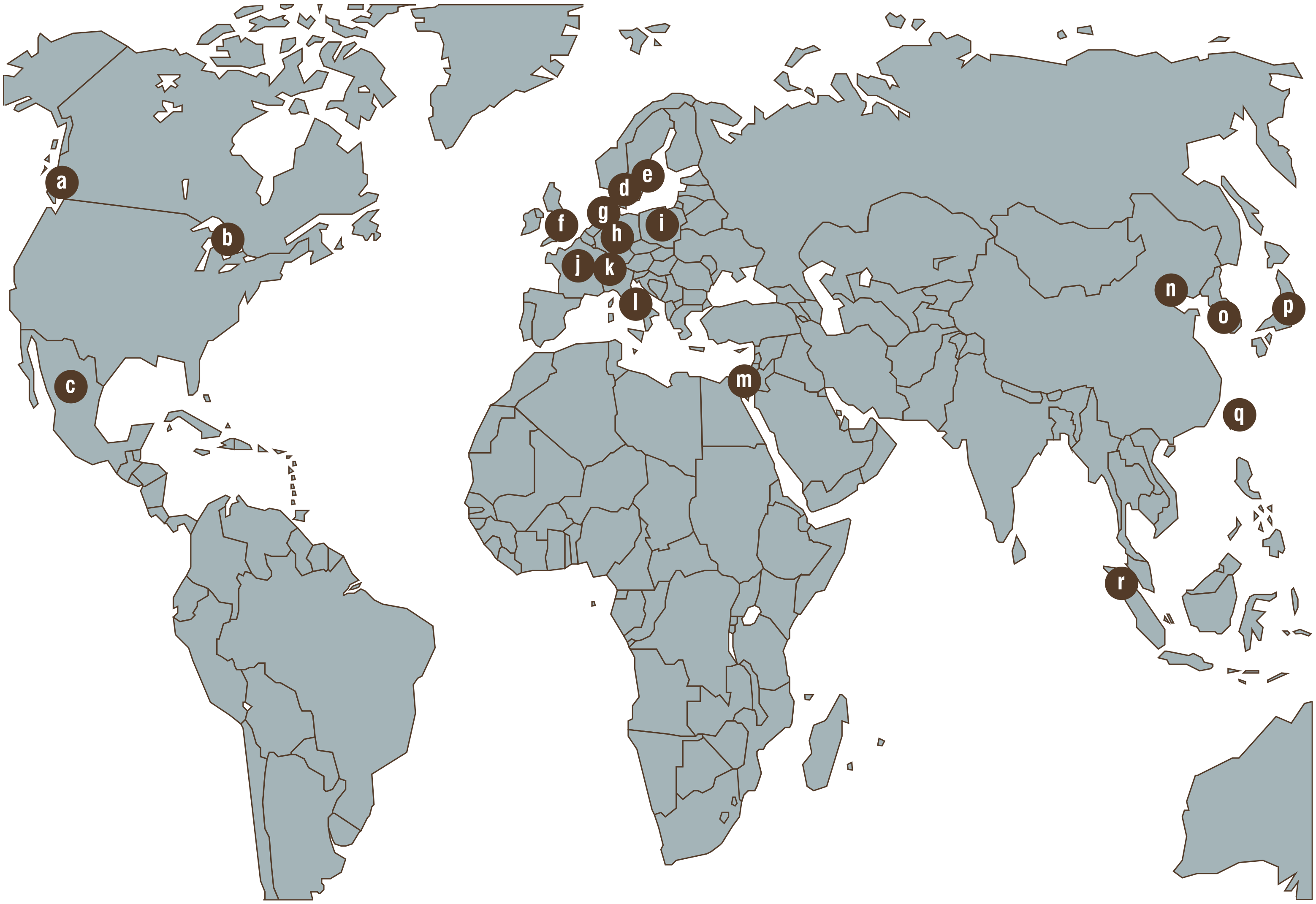


Programmable Joystick Controller: T-JOY *				
Model	Current Draw (mA)	Length (mm)	Width (mm)	Height (mm)
T-JOY3	50	200	122	102

* Additional specs available at www.zaber.com

One of our primary goals at Zaber has always been to hire people who will enjoy their work. Our hobbies and interests are reflected in the roles we play within the company, and many of us would be doing much the same work whether we were being paid to or not. People who work happy work better, and that is reflected in the quality of our products and customer service.

– Rob Steves, President, Zaber Technologies



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Accuracy

The maximum deviation between the actual position and the instructed position over the full range of travel.

Backlash (Hysteresis)

The change in actual position that results from approaching the target position from the opposite direction.

Resolution

The smallest increment that a motion control device can be instructed to move (one microstep). The actual motion of the device may be different, due to error, backlash, and other mechanical characteristics.

Horizontal Runout

In the case of a linear stage or slide, this represents the maximum horizontal deviation of the stage from the axis of travel as the device is moved through its full range of motion.

Stage Parallelism

In the case of a linear or rotary stage, this represents the maximum deviation in stage height over the surface of the stage with the stage fixed at any single position in the range of travel. This should not be confused with the vertical runout.

Vertical Runout

In the case of a linear or rotary stage or slide, this represents the maximum vertical deviation of a point on the stage surface as the device is moved through its full range of motion.

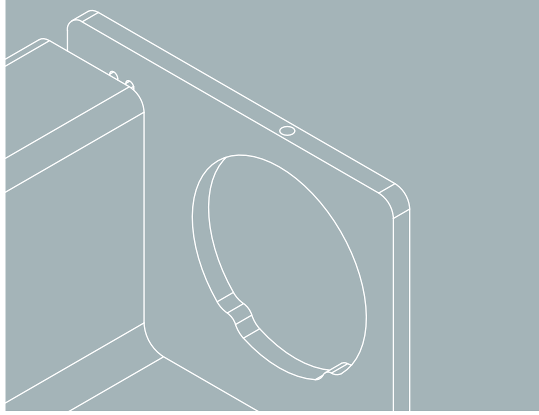
Repeatability

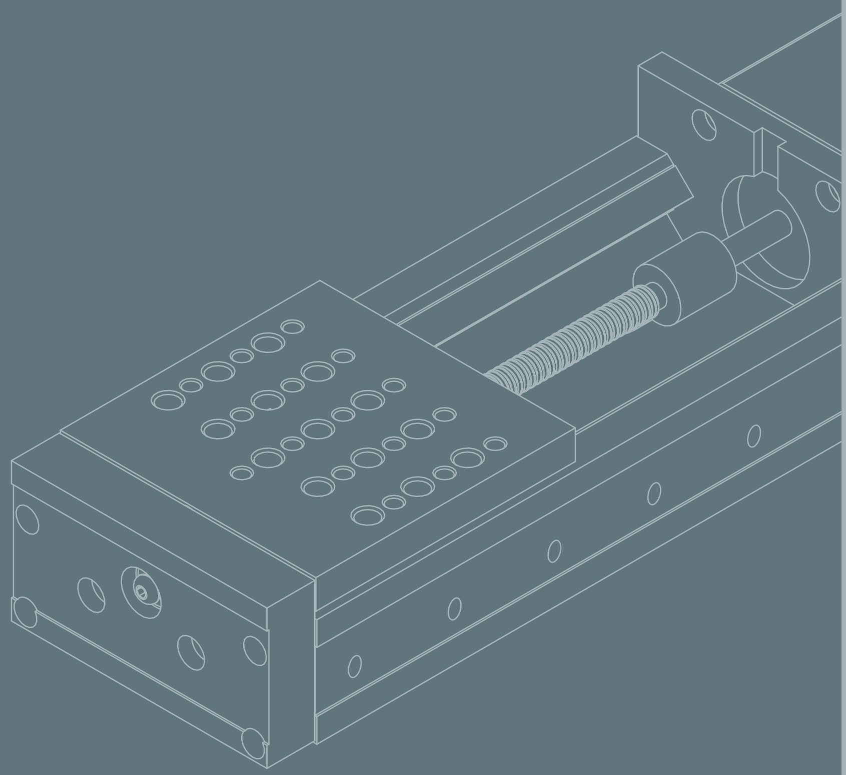
The deviation in actual final position when repeatedly instructing a device to move to a target position, approaching from the same direction every time.

ZABER

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